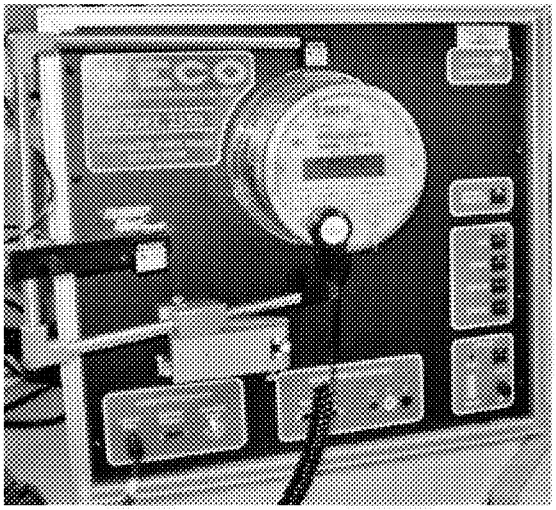
Standard Number: **4980.05**
Superseding: New
Effective Date: August 20, 2014
Page: 1 of 6

Seattle City Light
MATERIAL STANDARD

Certified Test Data Requirements, Electricity Meters



DRAFT

1. Scope

This standard covers the requirements for certified test data from 0.2 and 0.5 accuracy class electricity meters.

2. Application

Certified test data is used for the approval and verification of 0.2 and 0.5 accuracy class electricity meters.

3. Industry Standards

Certified test data shall meet the requirements of the latest revision of the following industry standards:

ANSI C12.1-2008; Electric Meters Code for Electricity Metering

ANSI C12.10-2011; Physical Aspects of Watthour Meters - Safety Standard

ANSI C12.20-2010; Electricity Meters - 0.2 and 0.5 Accuracy Classes

IEC 61000-4-4:2012; Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test

IEEE C37.90.1-2012; IEEE Standard for Surge Withstand Capability (SWC) Tests for Relays and Relay Systems Associated with Electric Power Apparatus

Standards Coordinator	Standards Supervisor	Unit Director
Robin Byun	John Shipek	Darnell Cola
Robin Byun		Darnell Cola

4. Requirements

4.1 Certified Test Report

Certified test reports shall be supplied by email.

The email shall be sent to the meter lab at meter.test@seattle.gov.

4.2 Certified Test Data Format

The certified test data file shall contain the following information in American Standard Code for Information Interchange (ASCII) format.

A heading with each line in text, in the following order:

Line #01 - Manufacturer
Line #02 - Type
Line #03 - Form
Line #04 - Class
Line #05 - Volts
Line #06 - Test amps
Line #07 - Watthour constant
Line #08 - Wires
Line #09 - Stators
Line #10 - Register ratio
Line #11 - Shaft reduction
Line #12 - Multiplier
Line #13 - Cost
Line #14 - Purchase date
Line #15 - Purchase order (PO) number
Line #16 - Stock number
Line #17 - Comm ID Type (any additional information up through line 19)
Line #18 - (for future use)
Line #19 - (for future use)
Line #20 - Comma separated data header[1]
Line #21 - Comma separated data[2]

---

[1] Line 20 contains the certified data header for listed data:

BarCode,Ser#,CL#,FL,PF,LL,LF,LP,MF,MP,RF,RP,Crt,Pal,CommID,CommIDType

Either FL,PF,LL or LF,LP,MF,MP,RF,RP are required.

A comma shall be included in place of unlisted data. For example, if CommID is not installed, its comma is still necessary.

Nothing prevents all the identified series and element tests above from being listed.

See Table 4.2 for data definitions.

[2] Line 21 begins the variable data record given as comma separated data. The record contains the meter bar code, serial number (in text), company number, certified test results, carton number, pallet number, and communications identification when applicable. Any data not given is identified in place by a comma.

Table 4.2. Comma-separated Data Header in Line 20

Abbreviation	Definition
BarCode	Bar Code
Ser#	Serial number
CL#	City Light assigned number
FL	Full load series unity test in a 3.2% format
PF	Power factor series 50% power factor test in 3.2% format
LL	Light load series unity test in 3.2% format
LF	Left element full load in 3.2% format
LP	Left element 50% power factor in 3.2% format
MF	Middle element full load in 3.2% format
MP	Middle element 50% power factor in 3.2% format
RF	Right element full load in 3.2% format
RP	Right element 50% power factor in 3.2% format
Crt	Carton number
Pal	Pallet number
CommID	Each meter's communications contacting identity
CommIDType	Communications module description

4.3 Examples of Certified Test Data Files

In the following two examples, a line number (Line #01) is included for clarification. This number does not appear in the actual test data file.

Example #1

Line #01 - Itron
Line #02 - C1SR
Line #03 - 2S
Line #04 - 200
Line #05 - 240
Line #06 - 30
Line #07 - 1
Line #08 - 3
Line #09 - 1
Line #10 - 1
Line #11 - 100
Line #12 - 1
Line #13 - 102.01
Line #14 - 9/28/2004
Line #15 - SCL-0000012345-P
Line #16 - 11679
Line #17 - R300HP
Line #18 -
Line #19 -
Line #20 - Barcode,Ser#,CL#,FL,PF,LL,LF,LP,MF,MP,RF,RP,Crt,Pal,CommID,CommIDType
Line #21 - 1NF000750795AZB02,750795,750795,100.09,99.95,100,,,,,,,1,1,12345678,R300HP
Line #22 - 1NF000750796AZB02,750796,750796,100.1,99.93,100.03,,,,,,,1,1,12345671,R300HP
Line #23 - 1NF000750797AZB02,750797,750797,100.12,99.99,100.11,,,,,,,1,1,12345672,R300HP

Example #2

Line #01 - GE
Line #02 - KV2C
Line #03 - 9S
Line #04 - 20
Line #05 - 120-480
Line #06 - 2.5
Line #07 - 1.8
Line #08 - 4
Line #09 - 3
Line #10 -
Line #11 -
Line #12 - 1
Line #13 - 264
Line #14 - 1/20/2004
Line #15 - SCL-0000010081-P
Line #16 - 400144
Line #17 -
Line #18 -
Line #19 -
Line #20 - Barcode,Ser#,CL#,FL,PF,LL,LF,LP,MF,MP,RF,RP,Crt,Pal,CommID,CommIDType
Line #21 - KZD028064370GCC03,28064370,750579,99.99,100,100,99.99,99.98,100.01,100.02,99.99,100,1B0001,3,,
Line #22 - KZD028064371GCC03,28064371,750580,99.99,99.97,100.01,100,100.01,100.02,99.98,99.99,100.02,1B0001,3,,
Line #23 - KZD028064372GCC03,28064372,750581,100.01,99.97,100.02,100.03,100,100,99.99,99.98,99.97,1B0001,3,,

4.4 Accuracy Class

4.4.1 Class 0.2 Accuracy

Class 0.2 accuracy of each meter shall be documented through a certified test report.

Test results shall not exceed the following error limits:

Table 4.4.1a. Series Tests for Class 0.2 Accuracy

Test	Error limit
Full Load	± 0.10%
Light Load	± 0.15%
Power Factor	± 0.15%

Table 4.4.1b. Element Balance for Class 0.2 Accuracy

Test	Error limit
Unity	± 0.20%
Power Factor	± 0.30%

Test results obtained during acceptance or verification testing shall not differ from the certified test reports bar ($\bar{x}$) by more than the following sigma (σ).

Table 4.4.1c. Series Tests During Acceptance or Verification Testing

Test	Error limit
Full Load	± 0.15%
Light Load	± 0.20%
Power Factor	± 0.20%

Table 4.4.1d. Element Balance During Acceptance or Verification Testing

Test	Error limit
Unity	± 0.25%
Power Factor	± 0.35%

Example: (Full Load)

Mfg. ($\bar{x}$) = 100.05%

Acceptable limits are 99.90% to 100.20%, (100.05% ± 0.15%)

SCL tests show ($\bar{x}$) = 100.10%, (σ) = 0.10%

The meters are acceptable because their statistical percentage of 1 σ is between 100.00% and 100.20%, and that is within the limits of 99.90% and 100.20%.

4.4.2 Class 0.5 Accuracy

Class 0.5 accuracy of each meter shall be documented through a certified test report.

Test results shall not exceed the following error limits:

Table 4.4.2a. Series Tests for Class 0.5 Accuracy

Test	Error limit
Full Load	± 0.25%
Light Load	± 0.35%
Power Factor	± 0.50%

Table 4.4.2b. Element Balance for Class 0.5 Accuracy (Polyphase)

Test	Error limit
Unity	± 0.40%
Power Factor	± 0.50%

Test results obtained during acceptance or verification testing shall not differ by more than the following sigma (σ) from the certified test reports bar x ($\bar{x}$).

Table 4.4.2c. Series Tests During Acceptance or Verification Testing

Test	Error limit
Full Load	± 0.25%
Light Load	± 0.35%
Power Factor	± 0.50%

Table 4.4.2d. Element Balance During Acceptance or Verification Testing (Polyphase)

Test	Error limit
Unity	± 0.60%
Power Factor	± 0.70%

Example: (Full Load)

Mfg ($\bar{x}$) = 100.10%

Acceptable limits are 99.85% to 100.35%, (100.10% ± 0.25%)

SCL tests show ($\bar{x}$) = 100.15, (σ) = 0.20, (limits of 99.95% to 100.35%)

The meters are acceptable because their statistical percentage of 1 σ is between 99.95% and 100.35% which is within the limits of 99.85% to 100.35%.

5. References

SCL 4911.05, “Kilowatthour Meters, Single-Phase, Electronic”, Material Standard

SCL 4913.05, “Kilowatthour Meters, Polyphase, Electronic,” Material Standard

SCL 4980.10, “Bar Code, Nameplate, Shipping Label Requirements, Electricity Meters,” Material Standard

6. Sources

Byun, Robin; SCL Standards Engineer, subject matter expert, and originator of 4980.05

Gilmore, Dan; SCL Meter Technician and subject matter expert for 4980.05

Matsen, Chuck; SCL Meter Technician and subject matter expert for 4980.05

Seattle City Light
MATERIAL STANDARD

Standard Number: **4980.10**
Superseding: New
Effective Date: August 22, 2014
Page: 1 of 8

Bar Code, Nameplate, and Shipping Label Requirements, Electricity Meters

1. Scope

This standard covers the requirements for electricity meter bar codes, nameplates, and shipping labels.

2. Application

Bar codes are used by meter electricians and meter technicians to identify, verify, and track electricity meters during shipping, receiving, testing, and installation.

3. Industry Standards

Bar coded nameplates and shipping labels shall meet the requirements of the latest revision of the following industry standards:

ANSI C12.1-2008; Electric Meters Code for Electricity Metering

ANSI C12.10-2011; Physical Aspects of Watthour Meters—Safety Standard

ANSI MH10.8.1-2005; Automatic Identification and Data Capture Techniques Used in Shipping, Receiving, and Transport Applications

NEMA Publication EI-P3-1984; Bar Coding of Watthour Meter Nameplate Data

4. Requirements

All new meters shall have the bar code information placed on the meter nameplate as specified in ANSI C12.10, 3.7.5.3 Barcoding Specifications.

The bar code shall be easily visible and readable with a noncontact scanner from the front of the meter with the meter cover on.

Standards Coordinator Robin Byun	Standards Supervisor John Shipek	Unit Director Darnell Cola
Robin Byun		Darnell Cola

4.1 Meter Nameplate

4.1.1 Nameplate Information

The meter nameplate shall include the following information:

- Manufacturer
- Type
- Form
- Class
- Volts
- Test amps
- Watthour constant
- Number of wires
- Number of stators
- Frequency of 60 Hz
- Hardware and firmware versions for solid-state meters
- "Seattle City Light"
- Bar code with manufacturer serial number
- Bar code interpretation
- Serial number
- 6-digit SCL number printed separately if it is not imbedded in the serial number
- Bar code for the 6-digit SCL number

4.1.2 Serial Number

Each meter nameplate shall include a unique manufacturer's serial number and a 6-digit number specified by Seattle City Light (SCL).

The 6-digit SCL number shall be imbedded in the serial number as the last 6 digits of the serial number, or it shall be printed as a separate number on the nameplate. See Figures 4.1.3a and 4.1.3b.

In both cases, the 6-digit SCL number shall be formatted as follows:

- Font: sans serif
- Weight: bold
- Height: at least 0.25 inches
- Width: at least 60% of the height (except for the number "1").

The manufacturer's serial number that precedes the 6-digit SCL number should be smaller to distinguish it from the SCL number.

4.1.3 Bar code

A bar code that follows the 17-character American Electric Power (AEP) standard shall be placed on the nameplate.

The bar code shall be Code 39 or Code 128.

The bar code shall conform to the meter specification bar code with leading zeros in the serial number.

The first 3 and last 5 characters in the bar code indicate the specifications of the meter.

The last character of the bar code identifies whether the 6-digit SCL number is imbedded in the serial number or is a separate number:

- A "2" states that this is a meter and the 6-digit SCL number is imbedded.
- A "3" states that this is a meter and that the 6-digit SCL number is separate.

A separate bar code for the 6-digit SCL number shall be printed if it is not imbedded in the serial number. See Figure 4.1.3b.

The words “Seattle City Light,” the bar code, and an interpretation of the bar code shall appear in a space sized at least 0.5 in by 2.5. Table 4.1.3 describes the text height of each line.

Table 4.1.3.

Line	Description	Text Height (in)
1	Seattle City Light	0.1
2	Bar code per the meter specification	0.2
3	Interpretation of the bar code	0.1

Figure 4.1.3a. Label with a 6-digit SCL Number Imbedded in the Serial Number (Not to Scale)

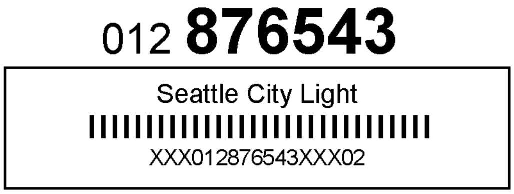
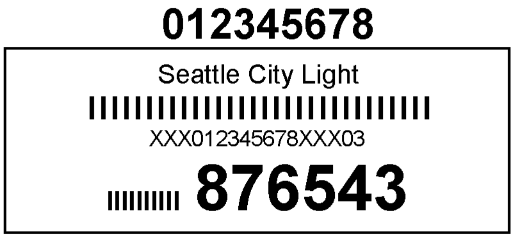


Figure 4.1.3b. Label with a 6-digit SCL Number Separate from the Serial Number (Not to Scale)



4.2 Identification of Shipping Container Contents

Each shipping container shall have one or two labels on the same side.

Each label shall contain the following information at minimum:

- Manufacturer
- Type
- Form
- Class
- Volts
- Seattle City Light purchase order (PO) number
- Seattle City Light stock number (if given on the specification)

Each meter inside each container (carton) shall be identified to that container.

The bar codes of the meters inside shall be on the same side of the container as the generic information.

Each meter's AEP bar code printing shall identify the following:

- Manufacturer's serial number
- Bar code interpretation
- Seattle City Light assigned number if it is not imbedded in serial number
- Bar code for any separate Seattle City Light assigned number

Only text and the bar codes for the meters inside each carton shall be on one label. Any other bar codes on the carton need to be separate from the bar codes of the meters contained inside. This is necessary to avoid confusion while scanning the codes for the contents inside the carton.

Figure 4.2a. Label without Barcodes or Serial Numbers

XYZ Company, type **X**, Form **2S**, Class **200**, **240** Volts, **PO#**, and **Stock #**

Figure 4.2b. Label with an Embedded 6-digit SCL Number

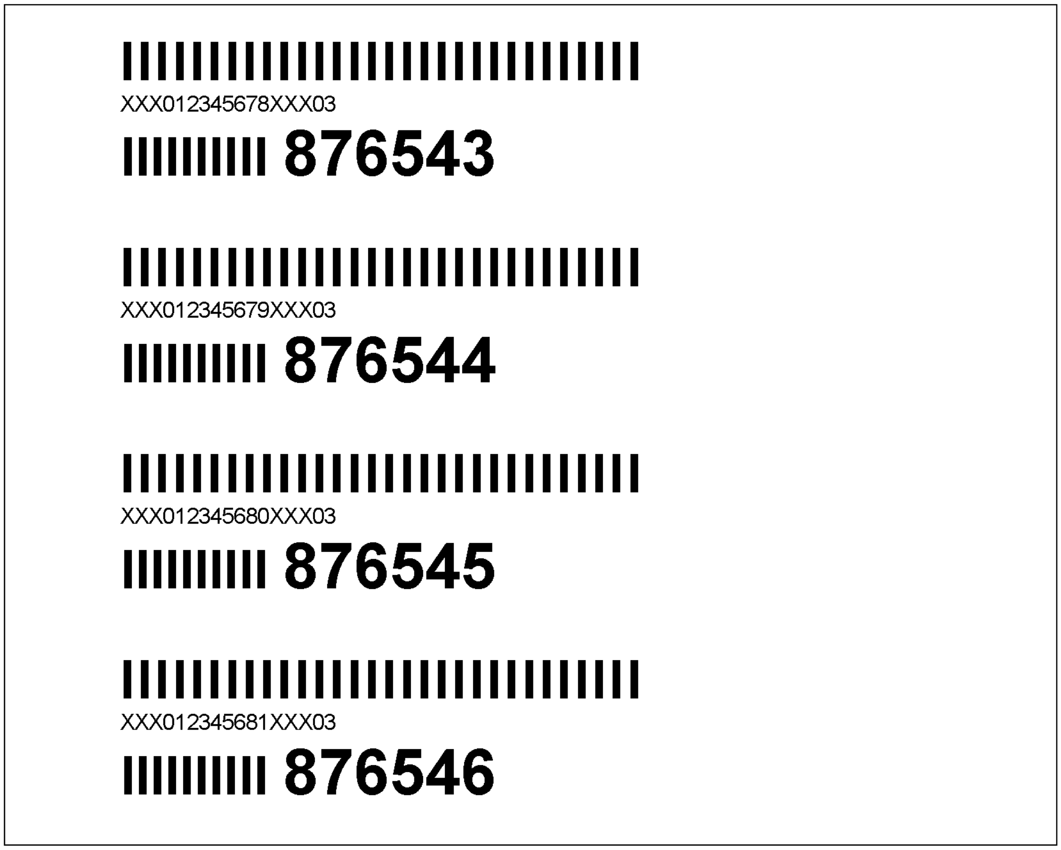
XXX012876543XXX02

XXX012876544XXX02

XXX012876545XXX02

XXX012876546XXX02

Figure 4.2c. Label with a Separate 6-digit SCL Number



XXX012345678XXX03

876543

XXX012345679XXX03

876544

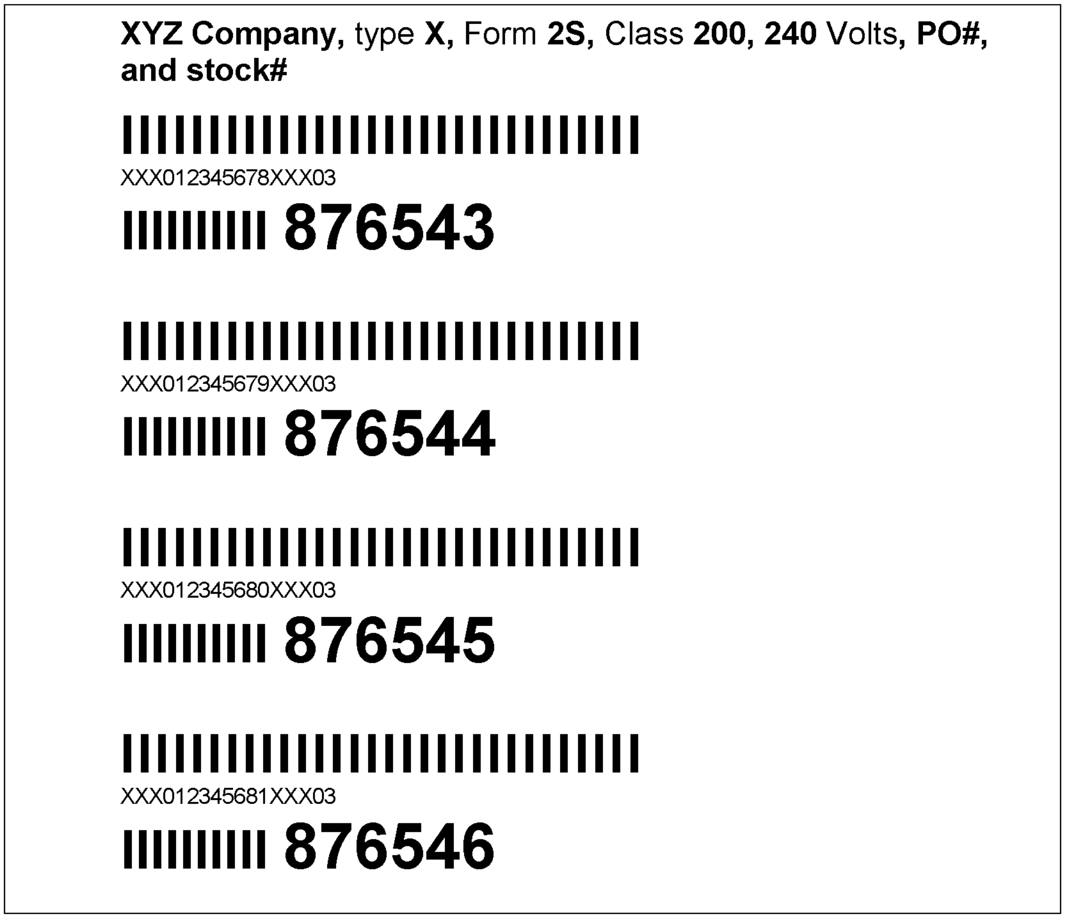
XXX012345680XXX03

876545

XXX012345681XXX03

876546

Figure 4.2d. Label with a Separate 6-digit SCL Number and Additional Information



XYZ Company, type **X,** Form **2S,** Class **200, 240** Volts**, PO#, and stock#**

XXX012345678XXX03

876543

XXX012345679XXX03

876544

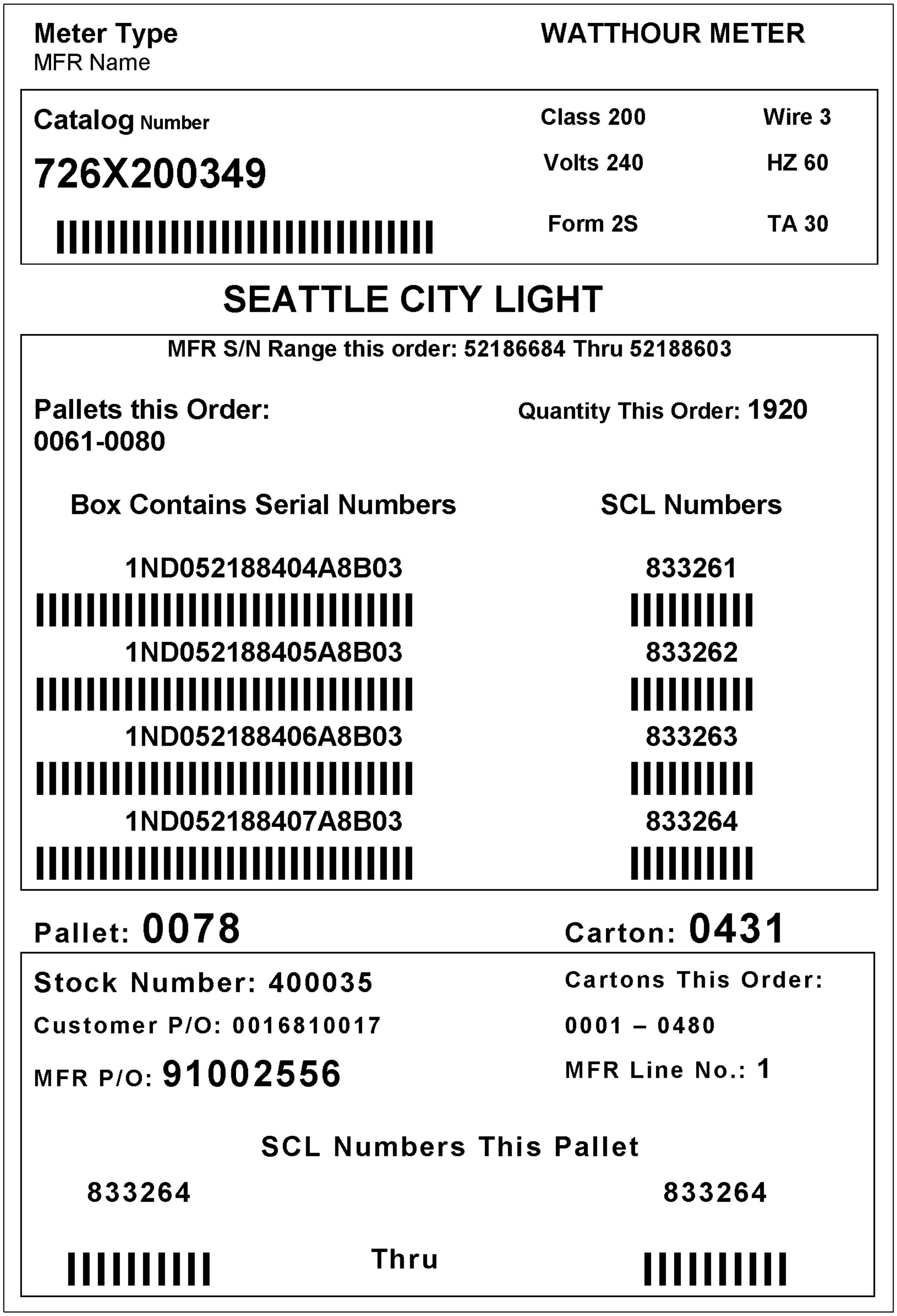
XXX012345680XXX03

876545

XXX012345681XXX03

876546

Figure 4.2e. Label with Bar Codes on the Container (Carton)



Meter Type **WATTHOUR METER**
MFR Name

Catalog Number
726X200349

Class 200	**Wire 3**
Volts 240	**HZ 60**
Form 2S	**TA 30**

SEATTLE CITY LIGHT

MFR S/N Range this order: 52186684 Thru 52188603

Pallets this Order:
0061-0080

Quantity This Order: 1920

Box Contains Serial Numbers	**SCL Numbers**
1ND052188404A8B03	**833261**
1ND052188405A8B03	**833262**
1ND052188406A8B03	**833263**
1ND052188407A8B03	**833264**

Pallet: 0078 **Carton: 0431**

Stock Number: 400035
Customer P/O: 0016810017
MFR P/O: 91002556

Cartons This Order:
0001 – 0480
MFR Line No.: 1

SCL Numbers This Pallet

833264 **Thru** **833264**

5. Nameplate Approval

The manufacturer shall submit drawings or samples for initial nameplate designs to Seattle City Light's Meter Department for approval prior to production.

Initial nameplate designs shall be submitted by email to the meter lab at meter.test@seattle.gov.

6. References

SCL 4911.05, "Kilowatthour Meters, Single-Phase, Electronic", Material Standard

SCL 4913.05, "Kilowatthour Meters, Polyphase, Electronic," Material Standard

SCL 4980.05, "Certified Test Data Requirements, Electricity Meters," Material Standard

NEMA Publication EI-P3-1984; Bar Coding of Watthour Meter Nameplate Data

AEP Meter Barcodes; https://www.aep.com/about/b2b/meterBarcodes

7. Sources

Byun, Robin; SCL Standards Engineer, subject matter expert, and originator of 4980.10

Gilmore, Dan; SCL Meter Technician and subject matter expert for 4980.10

Matsen, Chuck; SCL Meter Technician and subject matter expert for 4980.10.

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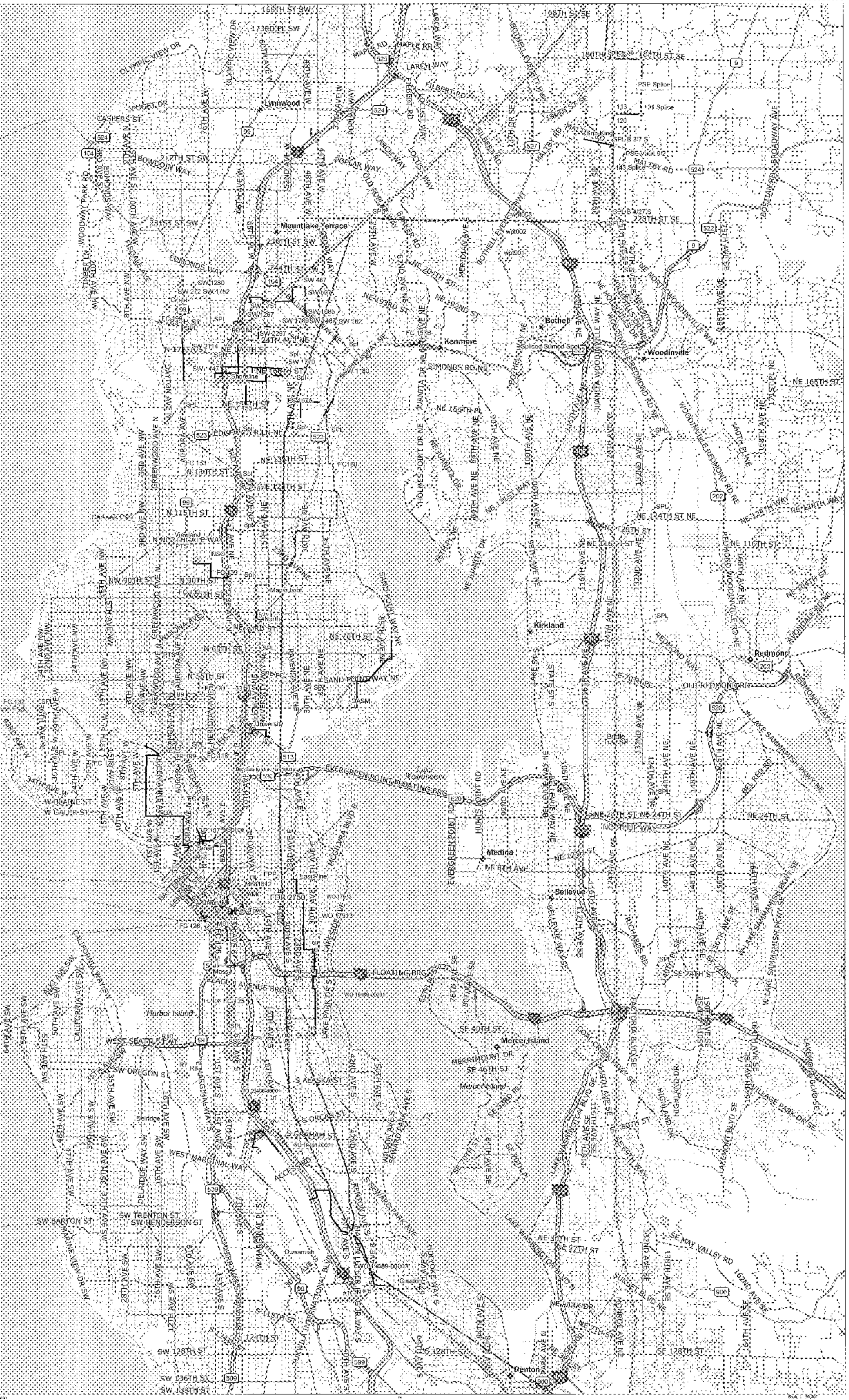

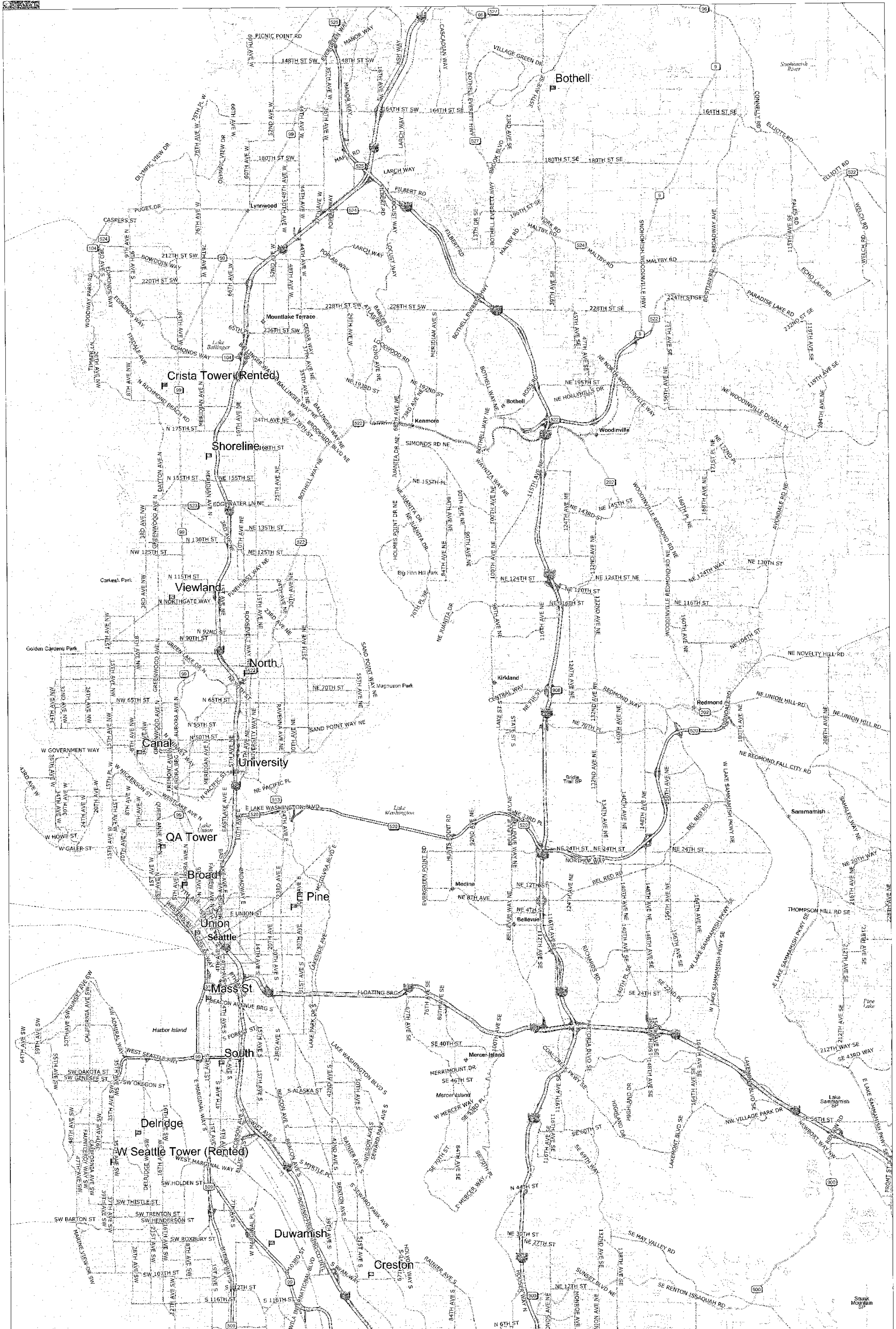

Scale 1 : 50,000

1" = 4,166.7 ft

Data Zoom 11-0

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www.delorme.com

Form	Volts	Wire	Quantity	Auto-Ranging Meter
1S	120V	2W	1515	
1S	240V	2W	6	X
1S	480V	2W	9	X
2S	120V	3W	9	X
2S	240V	3W	292775	
2S	480V	3W	44	X
2S - 320 Class	240V	3W	1250	
3S	120V	3W	8	X
3S	240V	3W	223	X
3S	480V	3W	5	X
4S	240V	3W	5023	
4S	480V	3W	85	X
5S/45S	120V	3W	58	X
5S/45S	240V	3W	91	X
5S/45S	480V	3W	226	X
6S/36S	120V	4W	48	X
8S/9S	120V	4W	427	X
8S/9S	240V	4W	532	X
8S/9S	277V	4W	38	X
8S/9S	480V	4W	6679	X
12S/25S Network	120V	3W	103606	
12S 3 Phase	240V	3W	389	X
12S 3 Phase	480V	3W	212	X
14S/15S/16S	120V	4W	4698	X
14S/15S/16S	240V	4W	2178	X
14S/15S/16S	277V	4W	436	X
14S/15S/16S	480V	4W	5802	X
22S Network	120V	3W	20	X
23S Network	208V	3W	95	X
		Total	**426487**	

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Click on any of the cells below to go to the designated matrix tab.

RFP Instructions
Vendor Information
Electric Meters
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AMI HeadEnd System
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Customer Service
Outage and Alarms
Distribution Operations
Demand Response
Asset Management
Pricing Requirements
Use Cases

RFP Instructions

•	The format of this RFP is designed to make answers succinct and streamlined. In many cases, there are opportunities for the vendor to expand upon their answers. It is desirable that these answers be as brief and to the point as possible. In some cases, the amount of text entered into a cell will exceed the allowed space and the cell will not automatically adjust its size. This should not be a cause for concern as the data is still present in the cell and can be viewed by the evaluators.
•	Many questions are formatted to allow a simple answer along with adding any additional comments.
•	Do not embed files or documents into any cell. Some questions will request or suggest an attachment to be added to the response package.
•	Requirements: These are minimum requirements for the solution and should be answered with "Comply" or "Do Not Comply". Value Add: These are additional requirements or questions which represent value added or differentiation of your proposed solution. Unless specifically indicated, these should be answered with "Yes", "On Roadmap" or "No".
•	There are typically 2 discrete columns for the answer to each requirement as shown below:

Requirement Number	Requirement	Response	Comments
1	The AMI Solution must …..		

•	In the example above, the respondent should select from the available answers in the "Response" column based on whether the particular feature or capability is currently available. When selecting that answer to any question, additional information should be provided in the "Comments" field.
•	An answer of "Comply" indicates that the specified feature is currently available, is implemented by at least 1 utility and complies with the utility requirement.
•	An answer of "Do Not Comply" indicates that the specified feature is not currently available or does not meet the utility requirement. For responses of Do Not Comply, additional information such as when the feature will be available or how the feature partially meets the requirement can be included in the Comments section.
•	There are typically 2 discrete columns for the answer to each value add feature as shown below:

Value Add Number	Value Add Feature	Response	Comments
1	Does the proposed solution have the xxxxx feature?		

•	In the example above, the respondent should select from the available answers in the "Response" column based on whether the particular feature or capability is currently available. When selecting that answer to any question, additional information should be provided in the "Comments" field.
•	An answer of "Yes" indicates that the specified feature is implemented and in production at a utility site.
•	An answer of "On Roadmap" indicates that the specified feature is not currently available but is planned for a future release. Vendor should indicate the date in the comments field when the specific feature will be available
•	An answer of "No" indicates that the specified feature is not currently available and there are no immediate plans to implement the features.
•	Questions that do not follow the format above ask for more descriptive answers. Space is provided for these answers. In some situations, the available space may not be large enough for the answer provided and the cell will not automatically resize to accommodate the answer. However, the entire answer will be captured in the cell and should therefore not be a cause for concern.

Vendor Information

Corporate Summary Information		
	Corporate Name:	
	Address Line 1:	
	Address Line 2:	
	City:	
	State:	
	Zip:	
	Corporate Web Address:	
	Parent Company (If Any):	
	Primary business focus	
	Number of employees	
	Primary Contact Person (Name):	
	Primary Contact Person (Title):	
	Primary Contact Person (Phone):	
	Primary Contact Person (Email):	
	Alternate Contact Person (Name):	
	Alternate Contact Person (Title):	
	Alternate Contact Person (Phone):	
	Alternate Contact Person (Email):	
Corporate Information		
	Number of employees associated with AMI solution R&D:	
	Number of employees associated with AMI solution delivery:	
	Annual gross revenues for 2012, 2013, 2014:	
	Percentage of gross revenues allocated to R&D for 2012, 2013, 2014:	
Project Information		
	Office from which project to be managed:	
	Address Line 1:	
	Address Line 2:	
	City:	
	State:	
	Zip:	
	Project Manager Name:	
	Project Manager Phone:	
	Project Manager email:	
Vendor Reference 1:		
	Company:	
	Description of Reference:	
	Applications in Use:	
	AMI Technologies in Operation:	
	# of C&I Meter Endpoints:	
	# of Residential Meter Endpoints:	
	# of Load Control Endpoints	
	# of Thermostat Endpoints:	
	# of In Home Display Endpoints:	
	# of Distribution Automation Endpoints:	
	# of Other Endpoints:	
	AMI Headend Integrated with other apps:	
	Contact Name:	
	Phone Number:	
	Email Address	
	Address Line 1:	
	Address Line 2:	
	City:	
	State:	
	Zip:	
Vendor Reference 2:		
	Company:	
	Description of Reference:	
	Applications in Use:	
	AMI Technologies in Operation:	
	# of C&I Meter Endpoints:	
	# of Residential Meter Endpoints:	
	# of Load Control Endpoints	
	# of Thermostat Endpoints:	
	# of In Home Display Endpoints:	
	# of Distribution Automation Endpoints:	
	# of Other Endpoints:	
	AMI Headend Integrated with other apps:	
	Contact Name:	

	Phone Number:	
	Email Address	
	Address Line 1:	
	Address Line 2:	
	City:	
	State:	
	Zip:	
Vendor Reference 3		
	Company:	
	Description of Reference:	
	Applications in Use:	
	AMI Technologies in Operation:	
	# of C&I Meter Endpoints:	
	# of Residential Meter Endpoints:	
	# of Load Control Endpoints	
	# of Thermostat Endpoints:	
	# of In Home Display Endpoints:	
	# of Distribution Automation Endpoints:	
	# of Other Endpoints:	
	AMI Headend Integrated with other apps:	
	Contact Name:	
	Phone Number:	
	Email Address	
	Address Line 1:	
	Address Line 2:	
	City:	
	State:	
	Zip:	
Vendor Questions		Response
1	How long has the vendor been offering an AMI solution? How long has the vendor been offerring the AMI solution proposed to SCL? Please use the comments field for the response.	
2	How many AMI implementations does the vendor currently have in service (in service is defined as more than 50,000 AMI meters installed, communicating and billing)?	
3	Do you have at least one utility customer with more than 500,000 AMI meters installed, operational and billing? Please indicate the utility with the largest installed AMI meter population.	
4	How many AMI projects are presently active (installing more than 500 meters per day)? List all active projects (break out by year) currently under contract through 2017 where there are 500 or more device installations per day	
5	How many AMI installations are presently in the first year of deployment?	
6	What is the size of the LARGEST AMI implementation in terms of endpoints? Please provide site information such as number of residential and commercial meters installed and communicating, square miles of coverage, etc. in additional comments. Also, please indicate if the AMI HeadEnd is hosted and operated by the	
7	What is the AMI implementation which is utilizing the most features and functions of your AMI solution? Please provide site information such as number of meters, number of network devices, systems integrated with the AMI HES and list of features utilized (with the year the feature was used in a production	
8	How many AMI installations are supported as a hosted or managed services solution? Include details about size, length of time in place, etc. Include reasons why a utility would want remote hosting of your AMI solution.	
9	Describe vendor's current commitments and capbility to meet SCL's requirements and timeline in regards to resources and equipment	
10	Does the vendor have a user's group that meets regularly? How long has it been in operation? Are utility representatives running the group?	
11	Please provide the product roadmap for the next 24 months in the section to the right. Alternatively, a separate attachment can be provided	
12	Have you specified the Delivery team which would be dedicated to SCL for the design and implementation of the AMI Solution? If so, will this team change?	

13	Does the vendor provide user and administrator training for the AMI HeadEnd Network Management System? Please provide a syllabus for this training.	
14	Does the vendor provide field and meter shop training for the AMI tools, AMI equipment and the RF Network? Please provide a syllabus for this training.	
15	Describe your standard support services, hours of operation and escalation policies and procedures for problem resolution.	
16	Describe the vendor support policy during the AMI implementation, immediately following the AMI implementation and ongoing support. Include your standard certification procedures for support personnel and average years of service in the support organization.	
17	Does the vendor provide hosting and operations services for the AMI solution? If so, please describe how many utility clients are using this service, the volume of data, the number of meters read daily and other information about the hosting service in the comments field.	
18	Are emergency response services available independent of any maintenance contract so as to handle critical or catastrophic situations? Please describe.	

Electric Meters

Requirement Number	Requirement	Response	Comments
1	All electric meters must be solid state with no moving parts other than what may be necessary for service disconnect capability.		
2	All electric meters must store data in ANSI C12.19 tables.		
3	All single phase electric meters must support the storage and reporting of at least 4 data logging channels.		
4	All polyphase electric meters must support the storage and reporting of at least 8 data logging channels.		
5	All electric meters must support the recording of forward, reverse and net (forward - reverse) energy registers as well as interval data.		
6	All polyphase meters must support the recording of 4 quadrant energy registers and intervals.		
7	All single phase meters must support data logging granularity of up to 15 minute resolution.		
8	All polyphase meters must support data logging granularity of up to 5 minute resolution.		
9	All electric meters must support the logging and delivery of voltage (average, instantaneous, minimum and maximum) data.		
10	All electric meters must capture a midnight snapshot of all register reads and make them available for retrieval for the 24 hours subsequent to midnight.		
11	All electric meters must support TOU metering with up to 5 tiers.		
12	All utility electric meter forms must be either directly supported or a reasonable and suitable alternative be provided. Please refer to Attachment 3 for list of current meters		
13	All electric meters must be capable of recording “rolling” and “block” demand values. Rolling demand subintervals shall include resolution as small as 5 minutes.		
14	All single phase self-contained electric meters (Forms 1S, 2S and 12S) must support the option of a remote disconnect/reconnect switch that does not derate the class amps or temperature characteristics in any way.		
15	All single phase electric meters equipped with remote disconnect/reconnect switch must be able to sense load side voltage when the switch is disconnected.		
16	All electric meters must support the remote upgrade/reprogramming of any firmware resident in the meter including communications, metrology, HAN, and any other resident firmware.		
17	All electric meters must provide some type of tamper detection. Please describe.		
18	All electric meters must have the ability to report specifically configured events in near real time to the AMI head end system.		
19	All electric meters must have the ability to report specifically configured events in the normal course of data collection.		
20	All electric meters must have the ability to record and deliver momentary and sustained outages inclusive of timestamp and duration.		
21	All electric meters must have enough available unused memory to support future upgrades and enhancements. Specify available memory and any applicable partitioning.		
22	All single phase electric meters must not use batteries.		
23	All electric meters, with integrated communications module, must be tested as a unit and proven as working and operating correctly prior to shipment from point of manufacture. Specify testing performed as it related to accuracy, functional capability and correct configuration.		
24	All electric meters must be capable of being reconfigured remotely with respect to data logging, register collection, event reporting, etc.		
25	All electric meters must have a temperature sensor and generate high temperature alerts.		
26	All electric meters must have a 5 year warranty		

Value Add Number	Value Add Feature	Response	Comments
1	Can all single phase electric meters support data logging and delivery granularity of 5 minute resolution?		
2	Can all polyphase electric meters support data logging and delivery granularity of 1 minute resolution?		
3	Are the interval channels individually configurable (e.g. One channel can be configured to 15 minute granularity and another can be configued for 5 minute granularity)?		
4	Are registers and intervals, which are delivered from the meter to the AMI HeadEnd, retrieved directly from the meter ANSI tables and delivered without manipulation? Please describe how registers and intervals are retrieved and delivered.		
5	Do the AMI meters collect and deliver a register read coincident with the end of interval for each load profile channel?		
6	Do all electric meters proposed support the capture and delivery of voltage or energy measurements every 5 minutes? If so, please describe in the Comments section.		
7	Can all electric meters support multiple (historical) midnight snapshot register sets and make these snapshot registers available for remote retrieval? If so, how many snapshots can be stored?		
8	Does the single phase self-contained electric meter support load limiting? If so, please describe the capabilities for load limiting and how this can be enabled and disabled remotely.		
9	How many events and alarms are available for monitoring and reporting for the single phase electric meters? Please provide a separate attachment with a list of all single phase electric meter events and alarms supported. Indicate whether the event or alarm is available for real time reporting through the AMI network.		
10	How many events and alarms are available for monitoring and reporting for the polyphase electric meters? Please provide a separate attachment with a list of all single phase electric meter events and alarms supported. Indicate whether the event or alarm is available for real time reporting through the AMI network.		
11	Do the electric meters have a temperature sensor? Please describe your capabilities or plans for hot socket detection and features to prevent damage to customer homes.		
12	Are all proposed electric meters UL certified? Please describe your plans to obtain UL certification for these meters.		
13	The single phase meters should have multiple displays (e.g. default, alternate, test). Describe the display capabilities of single phase meters.		
14	The polyphase meters should have multiple displays (e.g. default, alternate, test). Describe the display capabilities of single phase meters.		
15	The single phase electric meters should display instantaneous demand.		
16	The AMI meter should maintain a perpetual calendar for TOU and demand calculations. Please describe the calendar capabilities of the electric meters (both single phase and polyphase) and how this calendar is maintained in the meter. Include in this description any limitations of this calendar to TOU and demand meter reading, including seasonal support and demand reset.		
17	The AMI Polyphase meters should provide a KYZ option for customers requiring a pulse output. Describe the ability for polyphase meters to support KYZ (Form C), Form A Watthours and Varhours pulse outputs. Which forms support KYZ outputs?		
18	Do any of the proposed meters use batteries? If so, specify why the battery is required and the expected lifespan of the batteries.		
19	The AMI Solution should have multiple suppliers for each electric meter form. Does the proposed AMI Solution support more than 1 type or manufacturer of single phase and polyphase meter? List all meter types and manufacture supported by the system that meet the requirements stated in the RFP.		
20	The AMI meters should have an expected life greater than 20 years Please speficy the expected lifespan of each electric meter proposed?		
21	Does the AMI module maintain GPS (latitude and longitude) coordinates of its location? If so, please describe this feature and how the information is captured into the module and how the information can be retrieved from the module. Is the maintenance of GPS coordinates required for the AMI solution to function correctly?		
22	Please describe the ANSI testing which is performed on each new meter design or change. Describe the level of testing performed and the information captured during these tests. Describe the change conditions which will cause a complete ANSI certification testing to be conducted on the meter design. Describe what testing is performed on the meter only and on the meter with the AMI module. Describe what testing is performed on any firmware upgrade prior to release.	[redacted]	

Water Meters

Requirement Number	Requirement	Response	Comments
1	All water meter modules must support the storage and reporting of at least 1 data logging channels.		
2	All water meter modules must support the recording of consumption (GALLONS) registers at a resolution of 0.1 Gallons.		
3	All water meter modules must support load profile granularity to 60 minute resolution.		
4	All water meter modules must capture a midnight snapshot of all register reads and make them available for retrieval for the 24 hours subsequent to midnight.		
5	All typical utility water meter types and sizes must be either directly supported or a reasonable and suitable alternative be provided.		
6	All water meter modules must support the remote upgrade/reprogramming of any firmware resident in the module including communications firmware.		
7	All water meter modules must provide some type of tamper detection. Please describe.		
8	All water meter modules must have the ability to report specifically configured events in near real time to the AMI head end system.		
9	All water meter modules must have the ability to report specifically configured events in the normal course of data collection.		
10	All water meter modules must have enough available unused memory to support future upgrades and enhancements. Specify available memory and any applicable partitioning.		
11	All water meter modules must be capable of being reconfigured remotely with respect to data logging, register collection, event reporting, etc.		
12	All water meter modules must have a 5 year warranty		
Value Add Number	**Value Add Feature**	**Response**	**Comments**
1	Can all water meter modules support data logging granularity of 15 and 5 minute resolution?		
2	Can water meter modules support multiple (historical) midnight snapshot register sets and make these snapshot registers available for remote retrieval? If so, how many snapshots can be stored?		
3	How many events and alarms are available for monitoring and reporting for the water meter modules? Please provide a separate attachment with a list of all water meter events and alarms supported. Indicate whether the event or alarm is available for real time reporting through the AMI network.		
4	Is the water meter module battery replaceable in the field? Please specify the expected life of the battery and any impacts of firmware upgrades and interval granularity on this battery life.		
5	Does the proposed AMI water meter module support all commercially available water meters? List all water meter types, sizes and manufacture supported by the system that meet the requirements stated above.		
6	The AMI water meter module should have an expected life greater than 20 years? Please speficy the expected lifespan of each water meter module proposed?		
7	All water meter modules should be capable of monitoring water leaks. Please describe this capability.		

Street Lights

Requirement Number	Requirement	Response	Comments
1	All streetlight modules must mount on streetlights supporting the standard photocell receptacle per ANSI C136.10-2010 and SCL Material Standard 5693.10.		
2	All streetlight modules must have a 5 year warranty		
Value Add Number	**Value Add Feature**	**Response**	**Comments**
1	The proposed streetlight modules should support all of SCL's streetlights.		
2	All streetlight modules should support the remote control (on/off/dimming) of the streetlights		
3	All streetlight modules should identify and report, in real-time, outages of the streetlights		
4	The streetlight modules should measure and report the energy consumption of the streetlight with a granularity of at least 60 minute intervals.		
5	All streetlight modules should have the ability to report specifically configured events in the normal course of data collection.		
6	All streetlight modules should have enough available unused memory to support future upgrades and enhancements. Specify available memory and any applicable partitioning.		
7	All streetlight modules should be capable of being reconfigured remotely with respect to data logging, register collection, event reporting, etc.		
8	The AMI Solution should have the ability to monitor consumption of streetlights. Please describe the capabilities to monitor and report on the consumption of streetlights.		
9	The AMI Solution should have the ability to monitor streetlights. Please describe the capabilities to detect outage or problem situations with streetlights and the capability to integrate with SCL applications, such as work management and billing.		
10	The AMI Solution should have the ability to control streetlights. Please describe the capabilities to turn streetlights on or off, or set dimming scenarios, including interfacing with Street Light control applications.		
11	The AMI Solution should automatically discover and configure or provision AMI street light modules		

Communications Network

Requirement Number	Requirement	Response	Comments
1	All network equipment must meet applicable ANSI and NEMA standards. Please include all standards which the proposed network equipment has been certified in the Comments section.		
2	The AMI communications network must provide two-way communications at all levels of the network.		
3	The AMI communications network must comply with IPv6 standards. If the communication network does not presently support IPv6 standards, please indicate when this standard will be supported and what upgrade/replacement options would be available to SCL to meet this standard. Please describe how the network meets the IPv6 standard.		
4	The AMI communications network must cover 100% of SCL's meters and streetlights with the features, resolution and performance specified in Sections 4.2.2 and 4.3 in the RFP. The AMI Communications and Coverage Plan must cover 100% of SCL's meters or indicate how 100% meters can be addressed.		
5	The AMI communications network must support remote firmware upgrade to all endpoint devices and all network devices.		
6	The AMI communications network must support message prioritization. Please describe this prioritization and how the network ensures that firmware upgrades do not impact the network availability for data collection, endpoint control and endpoint events and how the quality of service for high importance messages is ensured.		
7	The AMI communications network must support the automatic discovery newly installed endpoint devices. Please describe how endpoint devices are discovered and what information is required at the AMI HES and/or AMI network to support the discovery. Please provide a 1 page attachment which fully describes the endpoint discovery and configuration process, including a timeline to show when meter reads will be available from newly installed AMI meters.		
8	The AMI communications network must support real-time events from all endpoint devices.		
9	The AMI communications network must suppport and enforce encryption to all endpoint devices. Please provide a 1 to 2 page attachment describing the security capabilities of the AMI communications network.		
10	All AMI communications network devices must continue to operate for at least 8 hours following a power outage.		
11	The AMI communications network must support communications into the customer home/premise.		
Value Add Number	**Value Add Feature**	**Response**	**Comments**
1	Briefly describe the types of communications technology (e.g. RF Mesh, Point to point, point to multi-point, Cellular, PLC, etc.) used in the proposed solution. Please describe the communications architecture for the proposed system starting from the HeadEnd system and ending with the metering endpoint. Include information for electric, water, and streetlight endpoints if different. Please include any standards used in this communication architecture.		
2	Does the proposed solution utilize cellular or third party communications? If so, please describe the expected Quality of Service (QoS) which SCL can expect and ALL costs which SCL would incur during the expected 20 years of operations.		
3	Does the proposed solution utilize any licensed communications frequencies? If so, please describe the availability of these licenses and ALL costs which SCL would incur during the expected 20 years of operations.		
4	Does the proposed soluiton utilize RF mesh communications? If so, please describe the average and maximum number of hops for the proposed Coverage and Capacity Plan as well as the impacts of each hop.		
5	The AMI communications network should support the ability to collect and deliver voltage or energy measurements every 5 minutes from up to 5% of the installed endpoint devices. Please confirm that the Coverage and Capacity plan will support this requirement.		
6	The AMI communications network should provide for the daily collection of registers and intervals at better than 99.5% reliability (e.g. 99.5% of the registers (midnite snapshot) and 99.5% of the intervals from yesterday must be received and available at the AMI HES by 6:00AM today). Please provide a 2 to 3 page description, as an attachment) of the daily data collection of data, including recommended communication rates, from endpoint devices. This description should provide a graphic description of all data flows and transports along with timelines and specifics for retries and gap filling.		
7	The AMI Network should meet the performance requirements without manual intervention. Please describe any tuning, evaluation and analysis, if required, to tune and validate the network performance and capacity meets the Coverage and Capacity Plan. Describe when this will occur and what performance the utility should expect out of AMI network without this tuning. Describe who does this tuning, evaluation and analysis.		
8	The AMI Network should have sufficient capacity to support growth in the number of endpoints and/or the frequency and quantity of data. Please describe the expected daily data volume of the proposed system (See Section 4.2.3 for expected data) and the % of the available bandwidth is consumed by this daily data volume.		
9	The AMI communications network should support the receipt and transport of outage and restoration messages for up to 90% of endpoints experiencing a power outage.		
10	The AMI communications network should restore full communications to any endpoint device within 5 minutes of the power restoration. Please provide a 1 to 2 page description of how the network restores communication after a large power outage or loss of a collector/tower. Detailed timelines for this restoration should be included.		
11	The AMI communication network should support the tunnelling of Distribution Automation protocols such as DNP and IEC 61850).		
12	The AMI communications network should maximize the utilization of SCL's fiber communications network. Please describe how the Coverage and Capacity Plan meets this requirement and indicate where other communications would be required.		
13	The AMI communications network and AMI HeadEnd System should support cellular communications to selected endpoint devices equipped with cellular modems. Please describe how the network supports multiple communication media and third party services.		
14	The AMI communications network must not have any single points of failure. Please describe the impacts of the loss of any network device (router, repeater, node, collector, gatekeeper, tower, etc.). Include an expected minimum, maximum and average time to reconfigure the network or reroute communications.		
15	The AMI communications network must complete control operations in a timely fashion. What is the minimum, maximum and average execution time for an On Demand Read? For a Disconnect operation? For a Connect operation? Of Firmware upgrade?		
16	Please provide communications deployment guidelines for the proposed system based on specific system restrictions, requirements, and limitations. (If an RF based system, please provide typical guidelines for number and location of collector and/or repeater devices. If a power line system, please provide typical guidelines for collector and/or repeater devices.) Note that SCL is requiring the coverage of any meter within the service territory. Please provide any concerns and recommendations		

17	Based on a recommended network deployment, how does SCL ensure that the number and location of network collectors and repeaters is sufficient to meet the performance and coverage requirements and that additional equipment will not be required to achieve the required level of performance?	[redacted]	
18	Please provide information on the RF emissions and the impact of the AMI technology on the public. Has your company participated in any studies or conducted studies related to this impact? How have customer issues been resolved? Include any whitepapers or studies as an attachment.	[redacted]	
19	The AMI communications network will be installed, operated and maintained by SCL personnel. Please describe the typical personnel requirements to maintain the AMI communications network, typical roles and responsibilities for these personnel and the typical activities required to maintain the network.	[redacted]	
20	Describe possible migration paths from your proposed WAN/LAN communication network solution to LTE or Fiber to the Home communications networks, if applicable. Include in the optional City Wide Wi-Fi Network proposal, the costs and processes required to facilitate the change to utilize the LTE or Fiber to the Home communications networks.	[redacted]	

AMI Tools

Requirement Number	Requirement	Response	Comments
1	The AMI Solution must provide tool(s) for the Meter Shop to test and configure AMI meters and endpoints		
2	The AMI Solution must provide ruggedized tool(s) for the Meter technicians to troubleshoot, configure and read AMI meters and endpoints in the field		
3	The AMI Solution must provide ruggedized tool(s) for the Field technicians to troubleshoot, configure and read AMI network equipment in the field.		
4	The AMI Solution must provide ruggedized tool(s) for field personnel to troubleshoot and analyze the AMI communications network and coverage		

Value Add Number	Value Add Feature	Response	Comments
1	The AMI communications network must utilize encryption for security. The AMI communications tools must support the decryption and encryption of endpoint devices and network devices as necessary to perform troubleshooting and configuration. Please describe how encryption keys are managed for the purposes of meter replacement and troubleshooting. How does a field technician obtain any keys or tools for the communication with the endpoint device in the field?		
2	The AMI Solution should provide, if requested and purchased, handheld devices for the installation of endpoint devices. If special handheld devices are not required, please indicate as such here.		
3	Please describe all software and hardware tools for the field technicians and meter shop personnel to support the troubleshooting and testing of the communications equipment. Please describe whether these tools are RF interfaces or optical interfaces to the meter.		
4	Please describe all software and hardware tools for the field technicians to support the troubleshooting and testing of the communications network. Please describe in detail the capability to determine signal strength at the meter, identify what neighboring meters or collectors can communicate with the meter, which meters are associated with a given collector, etc.		
5	Are there any alternative tools or communications for communication with the AMI meters or AMI network equipment (other than through the installed AMI network)? Is there a tool for collecting information from one or more meters, or network collectors, for scenarios where the network is unavailable or non-operational? Please describe		
6	What tools, reports and capabilities are included in the head end software to support the management and troubleshooting of the communications infrastructure? Provide samples where possible.		

AMI HES

Requirement Number	Requirement	Response	Comments
1	The AMI HES must operate on Solaris (Preference), Windows or Linux.		
2	The AMI HES must use Oracle Enterprise for its Database technology.		
3	All meter data in the database must be accessible via API or direct query.		
4	The AMI HES must be able to be deployed in a virtualized environment.		
5	The AMI HES must have standard reports.		
6	The AMI HES must have a perpetual license supporting a Dev, Test, Production and Disaster Recovery environment.		
7	The AMI HES must provide RBAC authorization and security capabilities.		
8	The AMI HES must have tools for the upgrade of versions and migration of configurations and data from different environments.		
9	The AMI solution must provide a secure upgrade process for hardware, software, communication messages and endpoint devices, including PKI lifecycle management and scanning for malicious files and detection of viruses.		
10	The AMI HES must have retry and gap filling capabilities to recognize gaps in data collected from any AMI meter and the retrieval of any missing data. Please provide brief details on the retry and gap filling capabilities in the Comments section.		
11	The AMI HeadEnd must support the remote (over the air) upgrade of AMI Communication Module, AMI Metrology and HAN firmware. The firmware upgrades should be prescheduled and activated (switched over) at a later time. Please describe the tools available to the user and how the AMI HeadEnd ensures that every device is successfully upgraded. What is the expected performance for this upgrade procedure? (e.g. Typically 95% of endpoint devices are successful upgraded over 10 days and the remaining 5% are upgraded over 30 days).		
12	The AMI HES must provide standard interfaces using MultiSpeak 3.0, or higher or IEC 61968-9 protocols for the integration for purposes of configuration and synchronization, billing and meter reading, OnDemand Read, Connect/Disconnect, event/alarm delivery, outage management, etc. Please provide list of all standard interfaces in the Comment section (a complete interface specification may be provided, but the listing of all available interfaces in Comments section is required)		
13	The AMI HES must support interfaces to an asset management system to allow the upgrade of firmware, reconfiguration of an AMI meter, query for asset configuration and status, query for disconnect meter status, etc. Please provide a list of all interfaces that support asset management as well as a roadmap availability for any interface not presently supported by the AMI HES. If the AMI HES will never support any asset management functionailty, please indicate as such in the Comments section.		
14	The AMI HES must manage encryption keys for the AMI communications network.		
15	The AMI HES must encrypt all user and meter passwords.		
16	The AMI HES must use Active Directory for user access and management		
17	AMI HES must store all meter data, configuration, and operation parameters within the Oracle relational database (e.g., not files)		

Value Add Number	Value Add Feature	Response	Comments
1	The AMI HES should be easily upgraded. Please describe the process for release and implementation of software upgrades. Please describe the testing processes associated with each software release and what information is provided with each upgrade (Attach the most recent software release notes and instructions provided with the most current release). Please describe the tools and recommended practice for validating and migrating configurations and data from Test environment to Production environment. Please include, as an attachment, your standard template for recording and change management for the AMI HES configuration.		
2	The AMI HES should not require frequent upgrades. Please describe when the utility must upgrade to the most recent release and any impacts to operating without upgrades. Please include, in the Comments section, a list of the upgrades, service packs and patches released for general availability over the last 36 months.		
3	The AMI HES should be compatible with Oracle MDM/SGG/ODM. Please describe how new version releases are aligned with Oracle. Are upgrades simulataneous with Oracle SGG upgrades?		
4	The AMI Solution should not require frequent firmware upgrades. Please describe when the utility must upgrade to the most recent firmware release and any impacts to operating without updated firmware. Does the AMI HES support all past version of endpoint firmware? Please include, in the Comments section, a list of the firmware patches and upgrades released for general availability over the last 36 months.		
5	The AMI HES should provide authorized users with direct access to the database to create custom reports. Alternatively, the AMI HES should provide tools or applications for users to create and export custom reports. Do you provide the database schema with the software license?		
6	The AMI HES should provide dashboards to support the quick evaluation of the AMI Solution and identification of critical issues, analysis of data collection performance and issues, the analysis of AMI network performance and issues, the analysis of data delivery performance and issues, the analysis of events/alarms performance and issus and to identify problem devices. Please describe the dashboards available in the Comments section.		
7	The AMI HES should provide reports to support the quick evaluation of the AMI Solution and identification of critical issues, analysis of data collection performance and issues, the analysis of AMI network performance and issues, the analysis of data delivery performance and issues, the analysis of events/alarms performance and issus and to identify problem devices. Please provide a list of all reports (grouped by functionality) supplied with the AMI HES.		
8	The AMI HES should ensure that complete collection of data from any installed AMI endpoint. Please describe how the AMI HES manages the process for collecting all data from this new meter since its initial installation time. If the meter is installed where there is no communication, does the AMI HES ensure that all meter data is collected from this meter once communication is established? Please describe any limitations where an AMI meter may collect information which is not automatically retrieved by the AMI HeadEnd.		
9	The AMI HES should support the remote configuration of one or a group of AMI endpoints without the support of solution vendor personnel. The AMI meter is a configurable device which can be programmed with multiple options. Describe how the AMI HeadEnd manages the different program configurations of a population of 800,000 endpoint devices What tools are available for this management? As part of this management, what activities are manual tasks and which activities are fully automated within the AMI HeadEnd? What interfaces are available for an external system to manage this grouping and remote configuration?		
10	The AMI HeadEnd should have the capability for polling and broadcasting to groups of meters (e.g. interrogate a group of meters for the purposes of determining power status, capture voltage reading for all meters on a feeder, etc.). Please describe how these groups are established and maintained and how meters are added to and removed from different groups. Is this an automated task, or manual task for group management? What interfaces are available for an external system to manage this grouping and executing broadcasts or polls?		

11	The AMI HES should be scalable to manage the growth in number of endpoints as well as the data collected. Please describe how the system can be scaled as the number of endpoints and data increases.		
12	The AMI HES should have the ability to archive and purge data according to a data strategy. Please describe what tools and services are available for archiving and purging data from the system.		
13	The AMI HES should support disaster recovery. Please describe what disaster recovery and hot backup solutions are supported by the AMI solution.		
14	The AMI Solution should be secure from unauthorized access and must ensure data privacy. Does the system comply with cyber security standards as defined in NERC Standards CIP-002-2 through CIP-009-		
15	o IEC 62351 Parts 1-8 Information Security for Power System Control o IEEE 1686-2007 Security for Intelligent Electronic Devices (IEDs) o End-point and communications security. o NERC CIP 002-009 Cyber Standards for the bulk power system o NIST Special Security Publication SP 800-53 & NIST SP 800-82. Cyber Security Standards and guidelines for Federal Information Systems for application in Bulk Power System o FIPS140-2 Security Requirements for Cryptographic Modules		
16	The AMI Solution should be secure from unauthorized access and must ensure data privacy. Please describe the security standards and practices in place to safeguard customer information from the time it enters the system via the AMI system until it is delivered to the AMI head end system.		
17	The AMI Solution's security architecture and implementation should be independently validated. Who are your partneres in the design or testing of your security architecture? Has anyone performed penetration tests on the solution. Please describe any testing or certification of your security		
18	The AMI HES will be operated, maintained and monitored by SCL personnel. Please describe the number, roles and skills of personnel recommended for administering and operating the AMI HES.	[redacted]	
19	List all software components, other than operating system and database, supplied with or required by the proposed solution. Indicate which components are supplied as part of the standard software license and which must be procured by SCL Indicate which components are open source.	[redacted]	

Meter Reading and Billing

Requirement Number	Requirement	Response	Comments
1	The AMI Solution must support all SCL rates (please refer to Attachment TBD).		
2	The AMI Solution must collect 99.5% of available data from the AMI endpoints on a daily basis. The Vendor must commit to meeting this metric for all meters as an acceptance criteria.		
3	The AMI Solution must manage the resetting of demand registers on the AMI meter on a scheduled basis. Please describe how the AMI HES manages this reset and ensures that demand reset has occurred. Where another information system (e.g. MDM or CIS) is required to provide some functionality for resetting and validating demand reset, please indicate as such.		
4	The AMI Solution must manage the resetting of demand registers on the AMI meter on an adhoc basis (e.g. move-in/move-out). Please describe how the AMI HES manages this reset and ensures that demand reset has occurred. Where another information system (e.g. MDM or CIS) is required to provide some functionality for resetting and validating demand reset, please indicate as such.		
Value Add Number	**Value Add Feature**	**Response**	**Comments**
1	The AMI Solution should be able to collect and deliver register reads to CIS as a standalone entity. SCL may deploy the AMI Solution for a subset of meters prior to the full integration with Oracle MDM and SGG. Please describe the capabilities and recommendation to support this standalone operation. Please include any standard interfaces and processes supported for the configuration (if configuration is required) of the AMI Solution from CIS and the delivery of billing determinants to CIS.		
2	The AMI Solution should collect and deliver register reads, interval data and voltage measurements to the Oracle MDM. Please describe your experience in integration with the Oracle MDM and all supported interfaces and standards. Please provide a utility reference for this integration, what functionality (list of integrations) they are using and what version of SGG and the AMI Solution is integrated. If no experience with Oracle MDM, please provide a utility reference for integration with an MDM, what functionality (list of integrations) they are using from this integration and the versions of MDM and AMI solution integrated.		
3	The AMI Solution should collect register reads, interval data and voltage measurements more often than once per day. Please describe any ability to capture and deliver data in real-time (or as it's collected) and any limitations on the collection and delivery to MDM frequency. Please provide a utility reference for the highest frequency of data delivery to an MDM.		
4	The AMI Solution should support On Demand Reads from any AMI endpoint. Please describe any limitations to the request for On Demand Reads (how many consecutive requests, how much data, etc.). Please describe all available interfaces and user interface to capture On Demand Reads and what data can be requested through each interface.		
5	The AMI Solution should capture, and deliver to the MDM, interval reads which have a register read coincident with the end of interval and which contain all available status and quality flags. Please provide details for the register read and interval read delivery and details for the status and quality flags applied to these reads.		
6	The AMI Solution should support the reconfiguration of the meter by changing the Meter Program for the purposes of recording different registersfor billing. Please describe the system capabilities to support this and the interfaces available for an MDM (or CIS) to execute and track these meter program		
7	The AMI Solution should support the change of interval length or number of channels delivered from an AMI meter without manual interaction or intervention. Please describe system capabilities and the interfaces available for an MDM, or asset management system, to execute and track these changes.		

Customer Service

Requirement Number	Requirement	Response	Comments
1	The AMI Solution must support On Demand Reads from any AMI endpoint. Please describe any limitations to the request for On Demand Reads (how many consecutive requests, how much data, etc.). Please describe all available interfaces and user interface to capture On Demand Reads and what data can be requested through each interface.		
2	The AMI Solution must support the remote connect and disconnect of an AMI meter equipped with an integrated disconnect switch.		
3	The AMI Solution must verify and report the successful, or unsuccessful, operation of the disconnect switch in the AMI meter.		
4	The AMI Solution must provide standard interfaces (MultiSpeak 3.0 or IEC 61968-9) which allow an external system to request an On Demand Read, request historical reads maintained in the database or execute a connect or disconnect of the integrated switch.		
Value Add Number	**Value Add Feature**	**Response**	**Comments**
1	The AMI Solution should provide the ability to "ping" a meter to validate the status of power or the status of the disconnect switch. Please describe the functionality available to validate the presence of power at the meter and the status of the disconnect switch (is this a direct check of the switch state, or a record of the last transaction sent to the meter?), what standard interface supports this validation and what information is retrieved and delivered.		
2	The AMI Solution should support the efficient disconnect or reconnect from a number of AMI meters. Please describe the ability to limit or spread the number of disconnects or reconnects issued to prevent too many simulataneous disconnects which may impact grid stability or call center load.		
3	The AMI Solution should validate and report on the successful or unauthorized, connect or disconnect of the AMI meter. Please describe all capabilities and validations available.		
4	The AMI Solution should complete any On Demand Read in less than 30 seconds. Please describe expected performance and limitations of the proposed AMI solution. Please provide a reference utility who could validate this requirement.		
5	The AMI Solution must complete any Connect/Disconnect operation in less than 60 seconds. Please describe expected performance and limitations of the proposed AMI solution. Please provide a reference utility who could vlidate this requirement.		
6	The AMI Solution should successfully complete any Connect/Disconnect operation 99% of the time. Please describe the features which ensure reliability of this operation and the expected performance of the AMI Solution. Please provide a reference utilty who could validate this requirement.		
7	The AMI Solution should provide the ability to disable disconnect functionality for all AMI meters. Please describe how this can be done for the proposed AMI solution.		
8	The AMI Solution should support load limiting where an AMI meter is equipped with an integrated disconnect switch. Please describe this capability.		
9	The AMI Solution should support prepayment. Please describe how the AMI solution supports prepayment. Please provide a reference utility who is using your AMI solution to provide prepayment services to its customers (not a pilot, but a production service)		
10	The AMI Solution should monitor for tamper conditions even when the disconnect switch is open		

Outage and Alarms

Requirement Number	Requirement	Response	Comments
1	The AMI Solution must provide a standards-based (MultiSpeak 3.0 or IEC 61968-9) interface for delivery of outage and restoration alarms for verifying power restoration/status.		
2	The AMI Solution must provide filtering of momentary and "false" outages. The AMI Solution must receive and store these filtered outages, but not deliver a notification.		
3	The AMI Solution must meet the outage performance of >90% successful receipt and delivery of outage events in small scale outages (less than 20 meters) in less than 10 minutes. Please indicate the expected performance and a reference utility who can validate the performance.		
4	The AMI Solution must meet the outage performance of >40% successful receipt and delivery of outage events in large scale outages (more than 3,000 meters) in less than 10 minutes. Please indicate the expected performance and a reference utility who can validate the performance.		
5	The AMI Solution must meet the outage performance of >95% successful receipt and delivery of restoration events in small scale outages (less than 20 meters) in less than 10 minutes. Please indicate the expected performance and a reference utility who can validate the performance.		
6	The AMI Solution must meet the outage performance of >65% successful receipt and delivery of restoration events in large scale outages (more than 3,000 meters) in less than 10 minutes. Please indicate the expected performance and a reference utility who can validate the performance.		

Value Add Number	Value Add Feature	Response	Comments
1	The AMI Solution should support the detection and reporting of power outages. Please provide a 1 to 2 page attachment with a detailed description of the timing (timeline must include time of power outage, time when message is sent from AMI meter and time when message is delivered from the network to the AMI HES) and data flows assocatiated with outage detection, including any filtering.		
2	The AMI Solution should support the detection and reporting of power restorations. Please provide a 1 to 2 page attachment with a detailed description of the timing (timeline must include time of power restoration, time when network communications is restored, time when message is sent from AMI meter and time when message is delivered from the network to the AMI HES) and data flows assocatiated with outage restoration including any filtering. This should include a detailed discussion about the AMI communications network and any impacts of communication restoration (minimum, maximum and typical) on the ability to deliver power restoration messages, or process power status requests (meter ping).		
3	The AMI Solution should support the request for power status from any single or group of AMI meters. Please describe the capabilities and limitations (number of simulataneous requests, network communication restoration, etc.) on the ability to request and report on the power status of AMI meters.		
4	The AMI Solution should maintain power during a power outage to allow the effective transmission and delivery of messages. Please describe the "holdup" time of the AMI meters and AMI network under a power outage condition. Please describe how messages are repeated or retried by the AMI meter and within the AMI network to maximize the successful delivery of outage messages.		
5	The AMI Solution should have filtering capabilities to reduce or eliminate reporting of false outages. Please describe all filtering available within the AMI Solution, including momentary outages, known outages (planned outages), open service orders, bellwether meters, etc.).		
6	The AMI Solution should report outage information in the collected interval reads. Please describe how the AMI Solution represents the interval where an outage occurred, the interval where the restoration occurred and the intervals between when the meter is without power.		
7	The AMI Solution should support the receipt and delivery of events and real-time alerts from AMI endpoint devices. Please provide a complete list and description of the events or real time alerts supported by the AMI HeadEnd. Include those that are metering specific as well as any that are more generic in nature. Indicate which events and alerts are available through an interface to the AMI HeadEnd and which can only be addressed within the AMI HeadEnd.		
8	The AMI Solution should support the reconfiguration of events and event thresholds. Please describe the interface and/or process for reconfiguring one or a group of meters to capture and deliver real-tme events. Describe any solution capabilities for event capture and delivery in the Comments.		
9	The AMI Solution should provide outage and restoration alarms to the Oracle NMS. Please describe any experience your solution has with integration with Oracle NMS, or any other OMS product. Please describe the available interfaces for this integration.		
10	The AMI Solution should detect and report single outages. What is the expected success rate for the outage to be received by the AMI HES? What is the amount of time that the meter will wait prior to reporting the restoration event? Is this time period configurable?		
11	The AMI Solution should detect and report a local outage involving 100 meters or less. What is the percentage of outage events that are expected to be received by the AMI HES? What is the percentage of restoration events that are expected to be received by the AMI HES? How does the system verify the restoration of those meters where a restoration event was not received?		
12	The AMI Solution should detect and report a large scale outage involving 3,000 or more meters. What is the percentage of outage events that are expected to be received by the AMI HES? What is the percentage of restoration events that are expected to be received by the AMI HES?		
13	The AMI Solution should maximize the delivery of restoration messages after a power outage. Are there any delays caused by the network as it is restored? Please describe any limitations or expections for network restoration. In the case where a meter restoration event occurs and the communications network or previous communications pathway is not present, how does the meter and the communications network react (e.g. network reconfiguration, alternative communications path, etc.)? What are the options and timings associated with establishing an alternative communications pathway?		

Distribution Operations

Requirement Number	Requirement	Response	Comments
1	The AMI Solution must support the collection and delivery of voltage measurements and power quality data from AMI meters via standard interfaces (MultiSpeak 3.0 or IEC 61968-9)		
2	The AMI Solution must support the addition of other distribution sensors such as fault current indicators, voltage and current sensors, etc.		
3	The AMI Solution must provide real-time alerts for high and low voltage situations at any AMI meter.		
4	The AMI Solution must support the capture and delivery of instantaneous voltage measurements from any AMI meter every 5 minutes. The AMI Solution must support this 5 minute requirement for at least 5% of the installed AMI meters.		

Value Add Number	Value Add Feature	Response	Comments
1	The AMI Solution should support dynamic voltage management services such as CVR. Please describe how groups of meters can be configured to deliver 5 minute voltage measurements every 5 minutes without impacting the other meter reading and collection configurations and operations. Provide a utility reference where this capability is in use.		
2	The AMI Solution should support message priorization such that distribution automation messages are the highest priority.		
3	The AMI Solution should support monitoring devices on the distribution grid. Please describe the devices supported by the AMI Solution, including fault current indicators, line monitors, voltage/current ssensors. Describe the features and capabilities and provide references where these devices are in		
4	The AMI Solution should support controlling devices on the distribution grid. Please describe the devices supported by the AMI Solution, including capacitor bank controllers, voltage regulators, and switches. Describe the features and capabilities and provide references where these devices are in production. Describe the iimitation of the AMI Solution and the situations where the AMI Solution is not a reasonable solution for use with Distribution Automation		
5	The AMI Solution should support the timely communication to distribution devices. What is the typical, minimum and maximum latency of the communications network for communication to distribution devices? For control of distribution devices?		
6	The AMI Solution should interface with Distribution Management solutions for the purposes of communication with and control of distribution automation devices. Please describe the integration of the AMI Solution with these solutions. Include any authentication and access control processe to ensure that devices are not accessed or controlled without proper authority.		
7	The AMI Solution should demonstrate support for Distribution Automation. Where has your AMI solution been used in support of Distribution Automation? How many and what type of endpoints where in place at this reference?		

Demand Response

Requirement Number	Requirement	Response	Comments
1	The AMI Solution must support communications and control of HAN devices, including Programmable Communicating Thermostats (PCT) and In Home Displays (IHD) in the customer's home or premise.		
2	The AMI Solution must support control of load control devices attached to customer equipment.		
3	The AMI Solution must support SEP 2.0. Please describe where SEP 2.0 support is on your roadmap and verify that all devices to be deployed for SCL will support upgrade to SEP 2.0 support.		
Value Add Number	**Value Add Feature**	**Response**	**Comments**
1	The AMI Solution should provide standard interfaces to support the management, message initiation, and control of HAN devices that are linked through the meter. Describe the automated processes and integrations associated with the setup and configuration of the HAN devices in the comments.		
2	The AMI Solution should provide communication and control of HAN devices. Please describe the HAN communications supported by your AMI solution. Does the AMI communications network communicate directly with the HAN devices? Does the AMI communications network communicate with HAN devices through the meter?		
3	The AMI Solution should provide consumption information to the user via HAN at a frequency and latency required to support energy management and monitoring by the consumer. Please describe the mechanism and limitations for delivery of consumption information to the in home devices.		
4	The AMI Solution should support the manage or participation in a Home Area Network (HAN). Please describe the role(s) that your metering/AMI module play in the formation and operation of a Home Area Network (HAN). Must the AMI module or meter act as the controller or concentrator? Can the AMI module or meter participate in the HAN network as a node to another gateway or controller? Please describe in detail how these different roles are enabled and used.		
5	The AMI Solution should support common load control devices such as hot water heaters, pool pumps, air conditioners. Please describe how your solution supports load control devices and the devices supported.		
6	The AMI Solution should allow communications to HAN devices which are certified to appropriate standards. Please describe the HAN devices that are certified, or have gone through testing and are qualified by your company as compatible with the AMI Solution.		
7	The AMI Solution should support display of information to an IHD. Please describe features and capabilities for display of data to an IHD. What features can be changed and updated from the AMI HES? How are broadcast messages initiated from external systems using the AMI Solution?		
8	The AMI Solution should be able to update the firmware of HAN devices. Please describe this process.		
9	The AMI Solution should authenticate or bind any new HAN devices and validate that the device is authorized to bind to the AMI network. Please describe the process for authentication and binding of the HAN device. Describe all steps and which steps are fully automated and which require manual interaction.		
10	The AMI Solution should not disassociate with the HAN device unless requested from the AMI HES.		
11	The AMI Solution should be able to program HAN devices with configurations required to participate in specific programs. Please describe these capabilities and process.		
12	The AMI Solution should reliably communicate with any HAN device in a customer's home or premise. Please describe solutions, tools, alternatives which are available to validate, ensure and troubleshoot communications to the HAN device.		

Asset Management

Requirement Number	Requirement	Response	Comments
1	The AMI Solution must capture and monitor the configuration, including firmware, of all endpoint and network devices.		
2	The AMI Solution must provide a standard interface to an Asset Management System to monitor, verify and change device configuration, firmware version and status. If such interfaces are not available, please indicate when these standard interfaces will be available.		
Value Add Number	**Value Add Feature**	**Response**	**Comments**
1	The AMI Solution should support the delivery of information to an Asset Management System. Please describe all interfaces and capabilities of the capture and delivery of endpoint device configuration, programming (Program ID), firmware version and status. Please provide a brief discussion on your solution's philosophy for management of endpoint device configuration by the AMI HES vs. an external asset management solution.		
2	The AMI Solution should integrate with Oracle's ODM. Has your proposed AMI solution been interfaced to ODM, or another asset management system? Please provide details of this interaction and integration.		
3	The AMI Solution should manage the endpoint and network devices. Please describe the asset management capabilities of the AMI HES.		
4	The AMI Solution should allow an external system to change the configuraton of any AMI endpoint device. Please describe if this capability exists, or when this capability will exist, and the functionality and validations which are or will be available for this. Does the AMI Interface support the reconfiguration of the meter Program for the purposes of recording different registers for the purposes of billing? Describe system capabilities in the comments.		
5	The AMI Solution should allow an external system to initiate the firmware upgrade of any AMI endpoint device. Please describe if this capability exists, or when this capability will exist, and the functionality and validations which are or will be available for this.		
6	The AMI Solution, in coordination with the MDM, will support the provisioning of new AMI meters. Provisioning is the automated process of identifying newly installed AMI meters, or removed AMI meters and the interaction with the AMI headend to ensure that the meter and system are correctly configured to deliver the required data on the required schedule. Describe your system's automated processes, flexibility and exception management in support of this activity. Include one reference (for each of the indicated MDM) where this automated provisioning process is in production.		

Pricing

Requirement Number	Requirement
1	SCL Requires 5 year pricing for AMI meters and AMI Network equipment
2	SCL Requires 5 year warranty on AMI meters and AMI Network equipment
3	SCL Requires a guarantee that the AMI Network requirements will not increase by more than 10% to meet all performance requirements
4	SCL Requires an unlimited perpetual license for the AMI HES without limit to the number of servers and environments
5	SCL Requires the option for hosted or managed services
6	SCL Requires fixed pricing for all professional services
7	SCL Requires 20 year committed pricing for any 3rd party communications required for the AMI Solution

Response	**Comments**

Use Cases

NOTE: THis is an important section of the evaluation of the functional and technical requi describe how well the AMI vendor understands the various AMI business processes and th

For each use case below, the response should indicate how the AMI solution supports this what is automated (does not require any manual interaction) and what special configurati indicate the responsibility for exceptions and reporting. The response must indicate wheth module, or customization.

Use Case Number	Use Case
1	AMI Provisioning
2	Meter read (register and interval) processing

3	Scheduled Demand Reset
4	Power outage
5	Power restoration
6	CVR/Voltage Management

7	AMI Rollout
8	AMI Key Management
9	AMI meter monitoring and maintenance
10	Connect and Disconnect

11	Prepayment
12	Meter firmware update and configuration change
13	Meter program change

ements for an AMI Solution. Answers to these use cases and activities will e role of the AMI Solution in these processes.

use case, what are the expectations for other systems and integrations, on or manual activities may be required. Additionally, the response should ner the support for this use case is part of the standard product, optional

Description
The AMI meter is installed, or removed. The 3rd party installation contractor's work management system, or utility service order, will update CIS and Asset Management with the removed meter and new meter information. CIS using the Master Data Synchronization integration, will provide change information to the MDM
The AMI HeadEnd requires information about the new AMI meter and a notification of the removed AMI meter.
The configuration and data from the new meter must be validated to ensure that the communication performance meets minimum thresholds for performance and that the data delivered from the new meter is consistent with the expected data profiles for this meter and
If this is the first time for this premise to have an AMI meter, CIS is notified that the AMI meter is properly configured, meets the minimum threshold for performance and is now ready for AMI billing.
Exception condition supported: AMI meter installed and not
Exception condition supported: AMI meter is communicating and no install information is available.
Exception condition supported: AMI meter does not meet performance and accuracy requirements.
Exception condition supported: AMI meter is not providing the correct information at the correct frequency.
Other exception conditions supported?
The AMI HeadEnd collects registers and intervals on a periodic schedule, along with the appropriate validity flags and events. The data is provided to the MDM and the MDM validates and estimates data.
Exception condition supported: No AMI data received from AMI
Exception condition supported: Meter reads not received
Exception condition supported: Meter reads are invalid.
Exception condition supported: Meter reads are received which were not expected.
Exception condition supported: Meter data missing due to power
Exception condition supported: Readings are flagged based on quality codes associated with reading data.
Meter data is re-requested from AMI HeadEnd in the event that any data is not received in a timely manner.

CIS identifies that billing determinants are required for scheduled (cycle) billing of the customer. CIS sends a requet for billing determinants. MDM retrieves and/or calculates the appropriate billing determinant (NOTE: The billing determinant should be actual data retrieved from the AMI meter if at all possible and only be estimated if actual reads are not available) and provides this to CIS. CIS calculates
Exception condition supported: Unknown premise or device location.
Exception condition supported: Billing determinants not available.
Exception condition supported: Excessive estimates detected for this account.
Exception condition supported: Implausibles detected/billing determinant does not pass validation
Exception condition supported: Demand reset failed to occur.
Premise experiences a loss of power. AMI meter detects power outage and initiates a last gasp transmission to the AMI Network and, ultimately to the AMI HeadEnd. (NOTE: In small outages, assume that 90% of last gasp messages are received at the AMI HeadEnd and in large outages, assume that 40% of last gasp messages are received at
Last gasp messages are validated for accuracy.
Last gasp messages are forwarded to the OMS after ensuring that the last gasp message is not due to momentary outage, planned maintenance, planned outage, etc.
OMS analyzes outage reports from AMI, IVR, etc. to locate the outage.
OMS or Dispatcher may ping the meter to validate that power is really
Outage metrics are calculated and reported. Outage history is analyzed to identify connectivity errors and other service problems.
Premise experiences a restoration of power. AMI meter detects power restoration and initiates a power restore transmission to the AMI Network and, ultimately to the AMI HeadEnd.
Power restore messages are validated for accuracy.
Power restore messages are forwarded to the OMS after ensuring that the last gasp message is not due to momentary outage, planned maintenance, planned outage, etc.
OMS analyzes restoration reports from AMI, SCADA, etc. to look for nested outages and manage the restoration effort.
Specific meters are identified to the AMI HeadEnd as "voltage sensing points" and deliver real-time (5 minute Volts RMS delivered every 5 minutes) voltage data.
Engineering determines low voltage threshold and instructs AMI HeadEnd to set the threshold for real-time events in the AMI meter.
SCADA controls load tap changer at substation feeder.
Real-time voltage information and real-time low voltage alerts are analyzed to determine if substation voltage can be further decreased or should be increased.
Voltage and consumption history is analyzed for application feedback and verification of demand response.

SCL wants to install AMI meters at specific locations, or as an overall rollout strategy. Installation locations are selected. Meters (and network) are ordered. Meters (and network) are received and inspected. Meters (and network) are scheduled for installation. Meters (and network) are installed. Meters are provisioned (see Use Case #1)
SCL needs to manage encryption keys for the endpoint devices to ensure secure transactions. Periodically, a meter technician will need to visit a meter and might need to use an individual key to allow access to the meter communication module.
AMI meter fails to deliver meter data. AMI meter identifies, through internal diagnostics, that there is a problem and sends an event (either real-time or as part of regular read data).
Meter problem is identified and a service order is created for a field visit and investigation to resolve the problem.
Meter data from AMI meter which indicates a fatal problem cannot be used for billing. The data received from the AMI HeadEnd should be labelled as invalid, stored and not used for any billing or display
AMI meter performance drops below acceptable performance
An investigation ensues with potential service order to visit the meter and resolve the issue.
Analysis of meter data, including VEE, identifies a suspect meter.
Meter problem is identified and a notification/communication is provided to CIS or WFMS.
A service order is created for a field visit and investigation to resolve the problem.
Meters removed from the field due to failure or suspected failure cannot be returned to the field without verification that the meter is operating and measuring correctly.
CIS, or user, determines that member's service should be disconnected. Order to operate meter is issued for AMI meter.
Disconnect order is validated against "OK to disconnect" rules (e.g. weather, time of day, holidays, medical, etc.).
Disconnect order is scheduled to ensure that no more than X disconnects will occur with a 15 minute period.
Disconnect orders are checked for grid impacts and other potential NERC CIP violations.
AMI meter is disconnected.
Connect/disconnect status of meter is fully synchronized with CIS.
Disconnected meter is monitored for unauthorized reconnect or
CIS, or user, determines that member's service should be reconnected. Order to operate meter is issued for AMI meter.
AMI meter is reconnected
Connect/disconnect status of meter is fully synchronized with CIS.
Exception condition supported: Meter does not have integrated switch.
Exception condition supported: AMI meter fails to operate or communicate, retry required, or field visit required.

Exception condition required: Disconnect switch fails to operate or AMI reports load side voltage prevents reconnect.
Member calls SCL to signup for Prepayment service. Account configuration and status is updated to reflect prepayment account and debt retirement terms.
Prepayment application/service is updated with account information and initiates service.
Consumption data delivered daily to prepayment service.
Prepayment service debits account, credits payments and monitors for when account funds will be exhausted.
Prepayment service notifies member of status and alerts upon impending disconnect or lack of funds.
Prepayment service determines disconnect is required and notifies CIS of required disconnect (alternative is to directly notify MDM/AMI of reconnect).
Disconnect meter per Use Case #10.
Member deposits funds
Prepayment service acknowledges funds and notifies CIS of required reconnect (alternative is to directly notify MDM/AMI of reconnect).
Reconnect meter per Use Case #10.
Connect/disconnect status of prepayment meters is not included in any service reliability metrics.
Meters associated with prepayment accounts are accounted for such that connect or disconnect status does not impact management of
Meter firmware versions are recorded and maintained for the meter with complete update history of remote or local firmware upgrades including support for multiple firmware sets within the meter.
AMI provider issues new firmware version and SCL engineers validate new version is acceptable to load into SCL AMI meters.
AMI HeadEnd is notified to upgrade single or multiple AMI meters with the latest firmware
Meters where the upgrade of firmware fails are identified and require follow up action to resolve the situation.
Distribution Engineers determine high/low voltage alarm thresholds for different meters
SCL offers a new tarriff to customers and a customer signs up for new tarriff. SCL determines that a new Program is required to be configured into the meter.
SCL views the AMI meter program and determines that a new program or configuration is required for the AMI meter based on thresholds, alerts or tarrif required.
AMI HeadEnd is notified to change meter program and/or configuration
AMI Meters are reconfigured with new program or configuration. No data should be lost

Response

Table of Contents

Click on any of the cells below to go to the designated matrix tab.

Electric Meter Pricing
Streetlight Control Module Pricing
Communication Network Pricing
AMI HeadEnd Software Pricing
Software and Tools Pricing
Project Services and Support
Managed Services Proposal

Note:

All fields should be populated in this pricing matrix.
For text fields, only text should be entered, no numbers.
For number fields, only numbers should be entered
All comments should be entered using the "Comments" option of Excel

Meter Pricing Table

This table reflect the existing needs for meter forms for SCL. Vendor should enter the unit price for each line item. This price should reflect the complete meter with the AMI module fully integrated in the meter, including shipping and handing for receipt at a location designated by SCL.

Meter Form	Voltage	Quantity	Unit Pricing	Extended Price	Meter Make/Model	Lead Time (weeks)
1S	120V	1,515		$ -		
1S	240-480V	15		$ -		
2S	120V-480V	53		$ -		
2S[1]	240V	292,775		$ -		
2S (CL320)	240V	1,250		$ -		
3S	120V-480V	236		$ -		
4S	240V	5,023		$ -		
4S[2]	240V	30		$ -		
4S	480V	85		$ -		
5S/45S	120V-480V	375		$ -		
5S/45S[2]	120V-480V	100		$ -		
6S/36S	120V	48		$ -		
8S/9S	120V-480V	7,176		$ -		
8S/9S[2]	120V-480V	300		$ -		
12S/25S[1]	120V	103,606		$ -		
12S 3 Phase	240V-480V	601		$ -		
14S/15S/16S	120V-480V	13,114		$ -		
15S/16S[2]	120V-480V	70		$ -		
22S	120V	20		$ -		
23S	208V	95		$ -		

Notes:

1. These meters shall include an integrated disconnect/reconnect switch.
2. These meters should have a KYZ pulse output

Meter Pricing Table

This table reflect the existing needs for street lights for SCL. Vendor should enter the unit price for each line item. This price should reflect the complete device with the AMI module and any associated mounting equipment or wires, including shipping and handing for receipt at a location designated by SCL.

Module	Voltage	Quantity	Unit Pricing	Extended Price	Module Make/Model	Lead Time (weeks)
Standard photocell receptacle per ANSI C136.10-	105-305V	86,000		$ -		
Standard photocell receptacle per ANSI C136.41-	105-305V	5,000		$ -		
				$ -		
				$ -		
				$ -		
				$ -		
				$ -		
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				$ -		

Notes:

Communications Network Pricing

Table 1

This table should be used to list all of the necessary communications infrastructure equipment necessary to implement the proposed AMI Solution for all of SCL's service territory to meet the specified performance levels. The listed equipment should include all concentrators, repeaters, antennas, batteries, test or deployment equipment, mounting brackets and any other equipment necessary to implement the system with adequate coverage to achieve the performance stated in the SCL RFP.

This worksheet should reflect infrastructure estimates for a system designed to support the collection of 15 minute data from all residential and 5 minute data from all commercial AMI endpoints including water as described in the RFP. If any third party communications is required for the solution, the monthly communications service fees should be included in the second table below as well as any additional supporting equipment.

Item #	Description	Quantity	Unit Pricing	Extended Price	Lead Time (weeks)	Comments
1				$ -		
2				$ -		
3				$ -		
4				$ -		
5				$ -		
6				$ -		
7				$ -		
8				$ -		
9				$ -		
10				$ -		
11				$ -		
12				$ -		
13				$ -		
14				$ -		
15				$ -		
16				$ -		
17				$ -		
18				$ -		
19				$ -		
20				$ -		
21				$ -		
22				$ -		
23				$ -		
24				$ -		
25				$ -		
26				$ -		
27				$ -		
28				$ -		
29				$ -		
30				$ -		

Table 2

This table should be used to list all of the necessary third party communications services required, where SCL communications infrastructure will not be used. Where possible, this should include a 20 year commitment to pricing or an estimate of yearly pricing increases.

Item #	Description	Quantity	Monthly Fee	Annual Cost of 3rd party communications	Annual increase in service fees	Comments
1				$ -		
2				$ -		
3				$ -		
4				$ -		
5				$ -		
6				$ -		
7				$ -		
8				$ -		
9				$ -		
10				$ -		
11				$ -		
12				$ -		
13				$ -		
14				$ -		
15				$ -		

AMI HeadEnd Pricing Matrix

This pricing should reflect functionality described in the Requirements Matrix. In the case wh
the Required Modules.

Core AMI HeadEnd Software

Product/Service	Implementation Size (Meters)*	Software License Cost
AMI Network Management Software for Electric Meters	425,000	
AMI HeadEnd Software incremental pricing (Indicate any incremental pricing if SCL adds 200,000 water meter modules to the AMI HeadEnd solution)	200,000	
AMI HeadEnd Software incremental pricing (Indicate any incremental pricing if SCL adds 86,000 streetlight control modules to the AMI HeadEnd solution)	86,000	

Individual Required Module/Component Pricing

upgrades, etc. Add product names and descriptions in the shaded areas below. These costs shoul
meters.

This section should also include licenses for any field tools or other software required for monitori

Product/Service	Implementation Size	Software License Cost

Optional Modules (add description and costs below)

This pricing should reflect the additional or optional modules which are available to SCL. This will
product names and descriptions in the shaded areas below. These costs should NOT be included i

Product/Service	Implementation Size	Software License Cost

ere there are additional modules necessary to complete the basic functionality, the

Annual Maintenance & Support Cost	Comments

d NOT be included in the volume pricing above. Please indicate where these modu

ng, troubleshooting or configuring network or endpoint devices

Annual Maintenance & Support Cost	Comments

include modules to provide outage management and filtering, Street Light monito
n the volume pricing above.

Annual Maintenance & Support Cost	Estimated Configuration, Testing and Implementation Support Services Cost	Co

ese should be listed and noted below in

les are priced relative to the number of

ring and control, analytics, etc. Add

nments

Other Software and Tools Pricing Table

This pricing should software and tools for the Meter Shop and Meter Field Technicians to troub Network and the AMI Meters. Include any equipment and products which vendor feels that SC Solution. In the table below, indicate the quantity of each product which a utility with 400,000 100,000 streetlights should consider purchasing to install and maintain the AMI equipment as v or support costs.

Product/Service	Quantity
Enter module name here	
Enter module name here	
Enter module name here	
Enter module name here	
Enter module name here	
Enter module name here	
Enter module name here	
Enter module name here	
Enter module name here	
Enter module name here	
Enter module name here	
Enter module name here	
Enter module name here	
Enter module name here	
Enter module name here	

leshoot and configure the AMI Communications
L will require to successfully implement the AMI
electric meters, 200,000 water meters and
vell as the applicable product and maintenance

Licensing or Product Cost	Annual Maintenance/Support Cost

Project Services

This pricing should reflect the additonal or optional services necessary to successfully deploy the system (See Services Requirements listed in the RFP (Section 4.7)).

Some of these services are requested as fixed price and the Cost should reflect vendor's fixed price quote, including travel, for this service. Where fixed price is not requested, vendor may proposed a fixed price quote for the service, or the hourly rate for the service along with a budgetary estimate of the service. Include any descriptive text about the service as well as your assumptions about the quote in the Description section.

Product/Service	Costs	Description
Program Management and Solution Implementation		
System and Network Analysis (RF Planning) [This should be fixed price]		
System Integration and Acceptance Testing		
Proof of Concept		
Training and Documentation [This should be fixed price]		
Network Tuning [This should be fixed price)		
Post Production and Support [This should be fixed price]		
Other Services (Enter name here)		
Other Services (Enter name here)		
Other Services (Enter name here)		
Other Services (Enter name here)		
Other Services (Enter name here)		

Other Services (Enter name here)		

Managed Services

This table should be used to list all of the necessary services for a managed services offerring, including servers, setup, monthly operations and, if requested, transition to SCL's data center. This service is intended support 400,000 AMI electric meters. This should reflect 36 month and 60 month term options.

Please separately list setup fees, transition fees and other one time activities and fees from the monthly/annual service fees. Also, where appropriate, please list any additional services and fees which could be charged to SCL for services not covered in the general hosting service.

NOTE: SCL may not choose to use hosted or managed services, so this section should be considered optional.

Item #	Description	Quantity	Unit Pricing	Extended Price	Lead Time (weeks)
1				$ -	
2				$ -	
3				$ -	
4				$ -	
5				$ -	
6				$ -	
7				$ -	
8				$ -	
9				$ -	
10				$ -	
11				$ -	
12				$ -	
13				$ -	
14				$ -	
15				$ -	
16				$ -	
17				$ -	
18				$ -	
19				$ -	
20				$ -	
21				$ -	
22				$ -	
23				$ -	
24				$ -	
25				$ -	
26				$ -	
27				$ -	
28				$ -	
29				$ -	
30				$ -	

INSURANCE REQUIREMENTS AND TRANSMITTAL SHEET

PURCHASING SERVICES REF: RFP SCL AMI 3404

City of Seattle Attachment No. 1

VENDOR: SEND THIS FORM TO YOUR INSURANCE PROFESSIONAL

INSURANCE AGENT/BROKER:

- PLEASE COMPLETE THESE FIELDS SO THAT WE MAY CONTACT YOU IF NECESSARY. *REQUIRED FIELDS

  *NAME: TITLE:

  *NAME OF COMPANY

  *EMAIL: *TELEPHONE: FAX:
- SEND ORIGINAL CERTIFICATION WITH COPY OF CGL ADDITIONAL INSURED ENDORSEMENT OR BLANKET ADDITIONAL INSURED POLICY WORDING TO:

  THE CITY OF SEATTLE PURCHASING SERVICES DIVISION
  ATTN: **Jason Edens**
  PO Box 94687
  SEATTLE, WA 98124-4678
- SEND COPY OF CERTIFICATION (INCLUDING COPY OF ADDITIONAL INSURED PROVISION) BY FAX TO (206) 470-1279 OR AS AN EMAIL ATTACHMENT IN ADOBE PDF FORMAT TO RISKMANAGEMENT@SEATTLE.GOV .

1. In the “Certificate Holder” field of the certificate of insurance, write “Attention: Michael Mears.”
2. Upon award of the contract, Vendor shall, at its sole expense and for the entire term of the contract, provide insurance to the City of Seattle (“City”) as checked below in 5 days or the city may withdraw its intent to award:

☒ **COMMERCIAL GENERAL LIABILITY (CGL) or** INSURANCE OR EQUIVALENT INCLUDING:

- ☒ PREMISES
- ☒ PRODUCTS-COMPLETED OPERATIONS
- ☒ CONTRACTUAL LIABILITY
- ☒ STOP GAP/EMPLOYER’S LIABILITY (UNLESS NO OBLIGATION TO INSURE WA STATE WC)
- ☐ **XCU AND SUBSIDENCE PERILS NOT EXCLUDED**
- ☐ **PRODUCTS/COMPLETED OPNS. ADD’L INSURED FOR THREE (3) YEARS FOLLOWING END OF CONTRACT**

MINIMUM LIMITS OF LIABILITY SHALL BE:

$1,000,000	EACH OCCURRENCE COMBINED SINGLE LIMIT BODILY INJURY AND PROPERTY DAMAGE (CSL)
$2,000,000	PRODUCTS/COMPLETED OPERATIONS AGGREGATE
$2,000,000	GENERAL AGGREGATE
$1,000,000	EACH ACCIDENT/ DISEASE—POLICY LIMIT/ DISEASE—EACH EMPLOYEE STOP GAP/EMPLOYER’S LIABILITY

☒ **AUTOMOBILE LIABILITY** INSURANCE FOR OWNED, NON-OWNED AND HIRED VEHICLES AS APPROPRIATE WITH MINIMUM LIMITS **OF LIABILITY SHALL BE $1,000,000** CSL.

NOTE: GARAGE LIABILITY WITH APPROPRIATE COVERAGES AND LIMITS OF LIABILITY MAY SUBSTITUTE FOR CGL AND AUTOMOBILE INSURANCE.

☐ **Garage Keeper’s Legal Liability (GKLL)** insurance to cover vehicles in vendor’s bailment. Minimum limit of liability of $ each vehicle and $ each occurrence.

☐ **“On-Hook” GKLL** coverage required with minimum limit of liability of $ each vehicle.

☐ **IN-TRANSIT POLLUTION LIABILITY CA 99 48/MCS-90** (N/A IF COVERED UNDER AN IN-TRANSIT EXTENSION OF A CONTRACTOR’S POLLUTION LIABILITY INSURANCE POLICY)

☒ **WORKER'S COMPENSATION** INSURANCE FOR WASHINGTON STATE AS REQUIRED BY TITLE 51 RCW.

☐ **UMBRELLA/EXCESS/BUMBERSHOOT LIABILITY** INSURANCE OVER CGL/MGL/AUTOMOBILE LIABILITY MINIMUM LIMIT OF LIABILITY SHALL BE ☐ $1,000,000 **CSL** ☐ **$** CSL ($ MINIMUM TOTAL LIMITS REQUIREMENT)

☐ **CONTRACTOR’S POLLUTION LIABILITY** INSURANCE. MINIMUM LIMITS OF LIABILITY SHALL BE ☐ $1,000,000 ☐ $ EACH CLAIM WITH A MINIMUM AGGREGATE LIMIT OF 200% OF THE EACH CLAIM LIMIT. THERE SHALL BE NO REQUIREMENT FOR A DEDICATED PROJECT AGGREGATE LIMIT PROVIDED THAT THE CONTRACTOR SHALL (1) SUBMIT TO THE CITY WITH ITS INSURANCE CERTIFICATION A WRITTEN STATEMENT FROM ITS AUTHORIZED INSURANCE REPRESENTATIVE THAT THE FULL MINIMUM AGGREGATE LIMIT IS AVAILABLE AND HAS NOT BEEN IMPAIRED BY ANY CLAIMS RESERVED ON ANOTHER PROJECT, AND (2) THEREAFTER, UNTIL THE COMPLETION OF THE WORK, THE CONTRACTOR SHALL PROVIDE NOTICE IN WRITING TO THE CITY WITHIN TEN (10) DAYS OF CONTRACTOR’S CONSTRUCTIVE KNOWLEDGE OF ANY PENDING OR ACTUAL IMPAIRMENT OF THE AGGREGATE LIMIT.

☐ **AVIATION LIABILITY** INSURANCE WITH MINIMUM LIMITS OF ☐$1,000,000 CSL OR ☐ $ CSL

☒ **PROFESSIONAL LIABILITY** INSURANCE WITH MINIMUM LIMIT OF LIABILITY $5,000,000 EACH CLAIM

☐ **WATERCRAFT/P&I LIABILITY** INSURANCE WITH MINIMUM LIMITS OF LIABILITY $

☐ **SHIP REPAIRER'S OR MARINA OPERATOR'S LEGAL LIABILITY** INSURANCE COVERING THE VENDOR'S LIABILITY FOR LOSS OR DAMAGE, INCLUDING LOSS OF USE, TO OWNERS OF WATERCRAFT WHILE IN THE VENDOR'S CARE, CUSTODY AND CONTROL FOR THE PURPOSE OF BEING REPAIRED OR SERVICED. MINIMUM LIMITS OF LIABILITY SHALL BE $ EACH VESSEL

☐ **JONES ACT LIABILITY** WITH MINIMUM LIMITS ☐ $1,000,000 OR $.

☐ **U.S.L. & H. LIABILITY** INSURANCE WITH MINIMUM LIMITS OF LIABILITY **$**

☐ **MISCELLANEOUS**: WITH MINIMUM LIMIT $

TERMS AND CONDITIONS:

1. **City of Seattle as Additional Insured:** The CGL/MGL insurance shall include "the City of Seattle" as an additional insured for primary and non-contributory limits of liability.

2. **No Limitation of Liability:** Insurance coverage and limits of liability as specified herein are minimum coverage and limit of liability requirements only. They shall not be construed to limit the liability of Vendor or any insurer for any claim that is required to be covered hereunder to less than the applicable limits of liability stated in the declarations. Moreover, the City shall be an additional insured, where additional insured status is required, for the full available limits of liability maintained by vendor, whether those limits are primary, excess, contingent or otherwise. Vendor expressly understands and agrees that this provision shall override any limitation of liability or similar provision in any agreement or statement of work between the City and Vendor.

3. **Claims Made Form:** If any policy is written on a claims made form, the retroactive date shall be prior to or coincident with the effective date of this contract. Claims made coverage shall be maintained by the Vendor for a minimum of three (3) years following the expiration or earlier termination of this contract, and the Vendor shall provide the City with evidence of insurance for each annual renewal. If renewal of the claims made form of coverage becomes unavailable or economically prohibitive, the Vendor shall purchase an extended reporting period ("tail") or execute another form of guarantee acceptable to the City to assure financial responsibility for liability assumed under the contract.

4. **Deductibles and Self-Insured Retentions:** Any self-insurance retention or deductible in excess of $ 25,000 that is not "fronted" by an insurer and for which claims the vendor or its third-party administrator is directly responsible for defending and indemnifying must be disclosed on the certificate of liability insurance. Vendor agrees to defend and indemnify the City under its self-insured or deductible layer and upon City's request advise the full delivery address of the individual or department to whom a tender of a claim should be directed.

5. **Notice of Cancellation:** Under RCW 48.18.290 (1) (a) and (b) ("Cancellation by insurer") applicable to insurers licensed to do business in the State of Washington, the City, as a certificate holder for the insurance requirements specified herein and an additional insured, has an interest in any loss which may occur; written notice of cancellation must therefore be actually delivered or mailed to the City not less than 45 days prior to cancellation (10 days as respects non-payment of premium). As respects surplus lines placements, written notice of cancellation shall be delivered not less than 30 days prior to cancellation (10 days as respects non-payment of premium).

6. **Qualification of Insurers:** Insurers shall maintain A.M. Best's ratings of A- VII unless procured as a surplus lines placement under RCW chapter 48.15, or as may otherwise be approved by the City.

7. **Changes in Insurance Requirements:** The City shall have the right to periodically review the adequacy of coverages and/or limits of liability in view of inflation and/or a change in loss exposures and shall have the right to require an increase in such coverages and/or limits upon ninety (90) days prior written notice to the Vendor. Should Vendor, despite its best efforts, be unable to maintain any required insurance coverage or limit of liability due to deteriorating insurance market conditions, it may upon thirty (30) days prior written notice request a waiver of any insurance requirement, which request shall not be unreasonably denied.

8. **Evidence of Insurance:**
   a. A certificate of liability insurance evidencing coverages, limits of liability and other terms and conditions as specified herein;
   b. An attached designated additional insured endorsement or blanket additional insured wording to the CGL/MGL and (if required) Contractor's Pollution Liability insurance policy.

   At any time upon the City's request, Vendor shall also cause to be timely furnished a copy of declarations pages and schedules of forms and endorsements. In the event that the City tenders a claim or lawsuit for defense and indemnity invoking additional insured status, and the insurer either denies the tender or issues a reservation of rights letter, Vendor shall in addition cause a complete and certified copy of the requested policy to be timely furnished.

   Send evidence of insurance to the City at the addresses at the top of this form. If any questions or issues, contact the City of Seattle Risk Management Division at direct telephone extension (206) 386-0071 or by email at riskmanagement@seattle.gov .

NOTE: CERTIFICATES WITHOUT ATTACHED ADDITIONAL INSURED ENDORSEMENT OR BLANKET ADDITIONAL INSURED WORDING WILL NOT BE APPROVED!